

1 TECHNICAL SPECIFICATIONS

1-1. General

- 3-1.1. **It is the intent of the Technical Specifications to describe the essential minimum requirements for construction and performance of the Type 1 Engine and associated equipment which will meet the operational needs of the Purchaser.**
- 3-1.2. Item(s) shall be complete with all equipment and accessories necessary for safe and efficient operation. They are to be delivered as a complete unit, certified and ready for immediate job site use at the La Honda Fire Station (8945 La Honda Rd, La Honda, CA).
- 3-1.3. It is intended that the manufacturer in the selection of components will use material and design practices that are standard to the industry for the type of operating conditions to which the item(s) will be subjected. Component parts shall be selected to give maximum performance, service life and safety and not merely meet the minimum requirements of this specification. All parts, equipment and accessories shall conform in strength, quality of material and workmanship to recognized industry standards.
- 3-1.4. If the specifications stated herein for component items do not comply with legal requirements, the bidder(s) shall so notify the Purchaser prior to the bid opening date.

1-2. Scope

- 3-2.1. To provide the Purchaser with one (1) Custom crew cab, full tilt style, 1500 GPM / 200 CFM Class A rated Triple Combination Pumper featuring fire pump, 750 gallon water tank, ground ladders, inverter, hand attack lines, deck master stream, Class A compressed air foam system and compartmentalized equipment storage body.

1-3. General Dimensions And Capacities

- 3-3.1. OVERALL HEIGHT NOT TO EXCEED 120 inches (including emergency, warning lighting and other appurtenances).

- 3-3.2. OVERALL LENGTH - Not to exceed 330 inches center line; of the front bumper to the rear of the tailboard.
- 3-3.3. Overall Width - not to exceed 98" width excluding mirrors.
- 3-3.4. WHEEL BASE - NOT TO EXCEED 165 inches.
- 3-3.5. TURNING RADIUS - NOT TO EXCEED 28ft.
- 3-3.6. CRAMP ANGLE - TBD at pre-construction meeting, shall comply with specified minimum turning radius above.
- 3-3.7. GVWR - GREATER THAN 40,000 lbs.,
- 3-3.8. GAWR - Front - 16,000 lbs., Rear - 24,000, MINIMUM.
- 3-3.9. APPROACH ANGLE - EQUAL OR GREATER THAN eighteen (18) degrees.
- 3-3.10. DEPARTURE ANGLE - EQUAL OR GREATER THAN fifteen (15) degrees.
- 3-3.11. BREAK OVER RAMP ANGLE - EQUAL OR GREATER THAN ten (10) degrees.
- 3-3.12. FLAT GROUND CLEARANCE - EQUAL OR GREATER THAN nine and one half (9.5) inches AT AXLES, twelve (12) inches elsewhere.
- 3-3.13. TAILBOARD, RUNNING BOARD, CAB ENTRY HEIGHT - NOT TO EXCEED 24 inches per NFPA 1901.
- 3-3.14. INTERMEDIATE STEPS - (Where Applicable) NOT TO EXCEED 18 inches FROM INITIAL STEP HEIGHT.
- 3-3.15. MAIN (LONGITUDINAL) - HOSE BED CAPACITIES
- Left side: 400 ft.- 1.75", double jacket hose, w/TFT pistol grip nozzles.
 - Left center 250' 2.5" double jacket with TFT Flip-Tip pistol grip nozzle
 - Right center: 800 ft. - 5 inch LDR hose w/ Storz couplings.
 - Right side: 1000 ft. - 3 inch DJRL hose. Right side: 400 ft. - 2.5 inch DJRL hose.
- 3-3.16. TRANSVERSE HOSE BED CAPACITY
- Two (2) x 200 ft. of 1.75 inch DJRL hose with TFT Flip-Tip nozzle / pistol grip handle.
 - One (1) x 200 ft. of 2.5 inch DJRL hose with TFT Flip-Tip nozzle / pistol grip handle.

- 3-3.17. PUMP CAPABILITY - 1500 GPM rating.
- 3-3.18. CAFS CAPACITY - 200 CFM AIR & 2.5 GPM FOAM.
- 3-3.19. WATER TANK CAPACITY - 750 (U.S.) Gallons minimum plus 30 (U.S.) Gallons foam tank.

1-4. Engine

3-4.1. ENGINE - GENERAL:

The apparatus shall be equipped with a diesel fueled type engine, that is rated by the O.E.M. for fire service type of use.

The engine / transmission power train shall be O.E.M. recommended compatible and rated for fire service type of use.

The engine shall be able to efficiently operate on low sulfur #2 diesel.

The engine shall have a certified brake horsepower rating necessary to meet the following requirements:

Meet or exceed all provisions applying to diesel engines in accordance with NFPA (Pamphlet 1901, 2009 edition or most recent revision).

All performance standards applicable to fire apparatus in accordance with NFPA (Pamphlet 1901, 2009 edition or most recent revision).

All performance standards as required in Section ~~Error! Reference source not found.~~ of this specification.

3-4.2. ENGINE - MAKE / MODEL / WARRANTY:

Engine shall be rated at 430 gross H.P. rated or greater. Shall be designed for use with Ultra-Low Sulfur #2 Diesel fuel, and shall meet all requirements including horsepower while operating on this fuel.

In addition to the fuel shutoff, provisions shall be made for an emergency shutdown in case of diesel runaway. The system shall be manual air dam-type operable from the drivers position and shall be able to reset without the use of any tools.

The engine shall come with a five (5) year warranty provided by the manufacturer.

The warranty shall cover the California emissions system (if applicable)

3-4.3. ENGINE INSTALLATION CERTIFICATION:

The fire apparatus manufacturer shall provide at the time of bid a letter from the engine manufacturer stating they approve of the engine installation. End Product Questionnaire shall be provided by the manufacturer.

3-4.4. EXHAUST SYSTEM:

The exhaust system, including piping and muffler(s) shall meet all O.E.M. engine recommendations but not to exceed operating noise standards described in Section 2-14 of this specification.

The exhaust system shall be designed for modular replacement. The exhaust system shall be designed and constructed not to expose any part of the apparatus to excessive exhaust heat. Adequate shielding and / or insulation factors shall be installed, when necessary.

The exhaust shall exit on the right side ahead of the rear wheels at a 45 to 60 degree angle and shall be at least eight (8) inches forward of the rear wheels.

Exhaust exit location shall be reviewed at pre-construction meeting to verify appropriate clearance to rope system anchor points.

1-5. **Cooling System**

The cooling system of the engine shall utilize the pressure-type system and be adequate in design and capacity to maintain a coolant temperature not in excess of the engine O.E.M. recommended maximum temperature under any normal operating condition or while stationary pumping. The system shall meet or exceed NFPA cooling standards.

The cooling system shall have adequate provisions to exhaust trapped air in the system and shall be a closed receiver system.

The cooling system shall be equipped with the largest O.E.M fan available.

The system shall incorporate an industry accepted coolant filter device, spin-on type, to be mounted in an easily replaceable location.

Silicone hoses equipped with constant torque type hose clamps shall be utilized throughout the cooling system, including any accessory systems (ie. cab heating system, heat exchanger etc.) which utilize engine coolant.

3-5.1. RADIATOR:

The fan shall be mounted directly to the cooling package and within a molded shroud to minimize the required fan tip clearances and to optimize air flow efficiencies and cooling performance. The system shall be shutterless.

A coolant recovery tank shall be provided.

The system shall have an electronic controlled low coolant indicator mounted on the cab instrument panel.

The completed core shall have a minimum 1200 square inches of cooling area. The entire cooling package assembly shall be mounted in a manner to prevent development of leaks caused by twisting or straining when the apparatus operates over uneven terrain. The radiator core shall be compatible with commercial antifreeze solutions.

The cooling system shall be protected with an antifreeze solution to minus 30 degrees Fahrenheit.

Nalcool radiator additive shall be added to the coolant as a corrosion inhibitor and lubricant.

3-5.2. AUXILIARY COOLING SYSTEM:

A supplementary heat exchanger cooling system shall be provided independent of the engine radiator.

The system shall be designed to circulate water from the discharge side of the pump through the engine cooling system without intermixing.

The apparatus builder shall use a system specifically designed for and rated as a heat exchanger, with related components constructed of brass or stainless steel.

The lines or hoses to and from the pump to auxiliary heat exchanger unit shall have a rated working pressure of no less than 500 psi and a minimum working temperature of 250 degrees Fahrenheit. NO EXCEPTIONS.

The system shall be located accessible for servicing and maintenance, but adequately protected from road hazards.

1-6. Fuel System:

3-6.1. Fuel System

The fuel pump shall be gear driven and meet all O.E.M. engine requirements for pressure and flow.

The fuel line shall be of the type which has a stainless steel wire braid covering with brass or stainless steel fittings and shall meet O.E.M. engine recommendations and be of sufficient diameter not to reduce engine horsepower while being operated at all conditions, at any speed. NO EXCEPTIONS.

The fuel system shall be designed to include the following features:

- Fuel level
- gauge and sender.
- Dual spin on fuel filters with manual shutoffs and drains (mounted accessible for service and replacement.
- Filter system shall be equipped with a water separator, sight bulb and indicator light.

3-6.2. Fuel Tank

A 60-gallon (minimum) fuel tank shall be provided and mounted at the rear of the chassis. The tank filler neck shall be 2" diameter, located in a convenient location on the apparatus body, exact placement to be determined at pre-construction conference. Filler shall be covered with a hinged, spring loaded, stainless steel door marked "Diesel Fuel Only".

A .50" NPT drain plug shall be located in a low point of the tank for drainage.

A .50" diameter vent shall be installed from tank top into fuel fill pipe just below the inlet.

The fuel tank shall meet all FHWA 393.67 requirements including a fill capacity of 95% of tank volume.

Servicing the fuel tank pick up tubes and the fuel gauge sending unit shall be capable of being accomplished without having to drain the fuel or drop the tank.

3-6.3. DIESEL EMISSION FLUID (DEF) TANK AND FILL

Apparatus shall be equipped with a DEF tank designed in accordance with NFPA 1901 guidelines, and California emissions requirements. Tank shall be sized to hold enough DEF to allow apparatus to operate through 3 full tanks of Diesel fuel. Tank shall be located such that it will be protected from mechanical damage including from road hazards. DEF fill shall be located to provide reasonable access for filling. Filling shall be accomplished without raising the apparatus cab. Exact placement of filler to be determined at pre construction conference. If fill is located on apparatus body it shall be covered with a hinged, spring loaded, stainless steel door marked "Diesel Emission Fluid".

3-6.4. DRIVELINE:

The driveline assembly shall be designed to meet GVWR of the vehicle, construction and performance to OEM specifications. The assembly shall be dynamically matched, balanced and installed not to exceed OEM lengths or deflection angles from the transmission to the rear axle.

All universals and slip shaft(s) shall have readily accessible Zerk fittings for lubrication.

3-6.5. LUBRICATION SYSTEM:

The engine shall be equipped with O.E.M. recommended full flow type filter system. Filter(s) shall be located in a position to allow service/replacement without removal or disassembly of any other components.

3-6.6. INTAKE SYSTEM:

The air intake system shall incorporate a heavy duty replaceable type air filter element with air restriction indicator, and the necessary plumbing to an adequate fresh air intake. Filter shall be protected from flying fire brands and water intrusion.

1-7. Engine Brake

The engine shall be equipped with a 3 stage Jacob's engine compression brake recommended by manufacturer for use with selected engine, with brake light actuation and cut-out relay when in the pump mode. Engine brake to activate upon release of accelerator when in the operation mode. A dash mounted control unit for the brake, with "on-off" and capable of "high"- "medium" - "low" functions shall be installed.

1-8. Transmission

3-8.1. TRANSMISSION - GENERAL:

The transmission shall be O.E.M. compatible with the engine and shall be rated for fire service use.

The transmission shall have a minimum of five (5) forward and one (1) reverse gear.

The shift module shall be mounted on the right side of the drivers seat within easy reach of the driver but adequately guarded from accidental shifting, and shall have a position indicator that is indirectly lit for after dark operation.

3-8.2. THE TRANSMISSION SHALL BE EQUIPPED WITH AND / OR HAVE PROVISION FOR:

- Adequate fluid reservoir not to require supplemental cooling system, largest pan option not to encroach on ground clearance.
- PTO port of appropriate configuration to support CAFS air compressor
- The proper torque converter, and relative components dynamically compatible and specifically for fire service type of use.

- An audible warning device mounted toward the rear of the apparatus and to be actuated when the transmission is placed in reverse. The device to be electric type and rated at a minimum of 85 decibels.

3-8.3. TRANSMISSION COOLER:

An external transmission oil cooler shall be provided.

3-8.4. TRANSMISSION WARRANTY:

The transmission shall have a five (5) year/100,000 mile warranty.

3-8.5. TRANSMISSION - MAKE / MODEL:

Transmission manufacturer shall be Allison 3000-series electronic five (5)-speed automatic transmission, push button controlled. Transmission shall be specifically approved by Allison for combination with the selected Diesel engine, and rated for emergency vehicle use. Specific Model/sub-model to be approved by the Purchaser at pre-construction conference.

1-9. Chassis

3-9.1. FRAME:

The under carriage, including frame, sub frames and sub frame support members, shall be constructed of the highest grade material rated for the weight application. All sub frames and support members shall be bolted to the frame with flanged head grade 8 bolts and nuts, no welding is acceptable. All frame rails, sub frame, and support members shall be painted black.

Each frame rail shall be constructed as one continuous unit channel design with no splicing or lap seam welding.

The frame shall be designed with adequate cross membering and constructed of the highest grade material rated for the apparatus weight application.

The frame shall be of sufficient section modules to carry a 25 year guarantee of material and manufacturers defects. The guarantee shall be provided by the apparatus builder at no additional cost to the Purchaser.

The frame shall have a R.B.M. rating of no less than 2,000,000 psi. NO EXCEPTIONS TO THIS REQUIREMENT.

3-9.2. FRAME - SPECIAL PROVISIONS:

The apparatus builder shall leave all of the following items listed below unpainted of any chassis color, undercoating and / or apparatus body finish; front axle and rear axle I.D. plates, all brake and relay valves, brake air lines, CAFS air lines, wire looms, any and all filters exposed below the frame rail, transmission, pump and pump transmission I.D. plates.

3-9.3. FRONT AXLE:

The front axle shall utilize a heavy duty I-beam to the minimum that delivers adequate load handling for designed maximum vehicle weight, providing comfortable ride characteristics. Steering spindle assembly and brake assemblies shall be used that any and all replacement parts should remain commercially available for a minimum of 20 years.

The turning angle shall be a minimum of 45degrees in either direction with wheels, tires and accessories installed.

The front axle shall maintain a road clearance of nine and one half (9.5) inches (minimum) or more, while the apparatus is parked and fully loaded with water, hose, equipment and personnel.

The front axle shall be furnished with oil filled hubs complete with seals and viewing window.

3-9.4. FRONT AXLE - MAKE / MODEL:

It shall be a Rockwell standard axle, model FL-943, or approved equivalent.

3-9.5. FRONT AXLE WARRANTY:

The manufacturer shall provide a five (5) year warranty with this axle.

3-9.6. REAR AXLE - GENERAL:

The rear axle shall utilize a single heavy duty housing with a single gear reduction type of differential. Every effort shall be made to utilize gear assemblies, axle shafts, brake assemblies, and bearings, with regard to replacement parts remaining commercially available for a minimum of 20 years. The differential gear ratio shall be selected in conjunction with other driveline component specifications to maintain road speeds and performances as required in Section **Error! Reference source not found.** of this specification.

The rear axle housing shall maintain a ground clearance of 9.5 inches (minimum) while parked fully loaded with water, hose, equipment and personnel.

The rear axle shall be furnished with oil seals.

3-9.7. REAR AXLE - MAKE / MODEL:

The rear axle shall be a Rockwell, model RS-23-186, or approved equivalent.

3-9.8. REAR AXLE WARRANTY:

The manufacturer shall provide a five (5) year axle warranty with this axle.

3-9.9. SUSPENSION FRONT:

The front spring assembly shall utilize two (2) semi-elliptically designed spring stacks, that have a constant rating to a minimum of the front GAWR or greater. The assemblies shall be securely torqued with heavy duty "U" bolts and double locking type nuts and bolt length not to exceed a 1/2" longer than lock nut coverage. All spring hangars and spring shackle assemblies shall utilize bronze bushings and be readily accessible for replacements (Rubber bushings are not acceptable.)

A heavy duty double action shock absorber shall be provided and mounted not to inhibit turning angles.

3-9.10. SUSPENSION - REAR:

The rear spring assembly shall utilize two (2) semi-elliptically designed spring stacks, that have a constant rating to greater than the rear GAWR (minimum).

The assembly shall be securely torqued with heavy duty "U" bolts and double locking type nuts, with bolt length not to exceed 1/2" longer than locking nut.

3-9.11. REAR AUXILIARY SPRING:

The auxiliary spring assembly shall utilize a spring stack designed in conjunction with the main spring assembly. The combined rating shall not exceed the weight distribution percentage as described in Section **Error! Reference source not found.** above. The free ends of the assembly shall remain a minimum of 1-1/2" from contacting the bumper pads while the apparatus is loaded of hose, equipment and personnel less the water tank capacity.

1-10. Bumper

3-10.1. The bumper shall provide full frontal protection, and shall be polished stainless steel. Bumper shall extend no more than 10" forward of the face of the apparatus cab.

3-10.2. TOW / ANCHOR EYES:

The front bumper shall be equipped with two (2) heavy duty round tow eyes, 3" minimum diameter, mounted on top of the bumper. The tow eyes shall have milled smooth edges and be triple chrome plated. Tow eyes shall be designed and positioned to allow a 20,000 pound straight horizontal pull in line with the centerline of the vehicle.

3-10.3. ACCESSORIES:

The bumper shall have the following accessories recessed mounted:

- Electronic siren speaker
- Air horns (2)
- Federal Signal Q-Siren

3-10.4. HOSE TRAY:

A hose tray, constructed of aluminum, shall be placed in the center of the bumper extension. The tray shall have the capacity to hold 100' of 1.75" SJRL hose with nozzle. Drain holes shall be provided in the bottom of the tray. Hose tray shall have a vinyl cover fastened in front and Velcro closures on three sides. Two spare covers shall be included with delivery.

1-11. Brakes

3-11.1. GENERAL:

Shall meet or exceed standards outlined by FMVSS, DOT, and National Fire Protection Association (Pamphlet 1901, 1996 Edition or most recent edition) for design and performance standards applicable to fire apparatus.

The system shall be designed to correspond with the GVWR of the apparatus and meet the performance standards outlined in Section 2-14 of this specification.

3-11.2. ANTI-LOCK BRAKE SYSTEM:

The vehicle shall be equipped with an anti-lock braking system. The ABS shall provide antilock braking control on both the front and rear wheels.

3-11.3. BRAKES, SPECIFIC PROVISIONS

3-11.3.1 The service brake system shall be of the full-air type by Rockwell-Standard.

3-11.3.2 The front brakes shall be drum type with automatic slack adjusters.

3-11.3.3 The rear brakes shall incorporate the automatic self-adjusting air actuated S-cam type.

3-11.3.4 The brakes shall be equipped with the maximum brake shoe area commercially available for vented 16.5" x 8" "Q PLUS" brake drums.

3-11.3.5 The air brake chambers used shall be a dual diaphragm with a minimum 3/4" pushrod, NO EXCEPTION IN THIS REQUIREMENT - TYPE 36 (MINIMUM). The chamber shall be equipped with a 1/4" NPTF test port.

3-11.4. AIR SYSTEM GENERAL:

The air system shall include a primary reservoir and a secondary reservoir, air compressor, air dryer, valves, parking/emergency brake system, audible/visual low air warning devices, individual reservoir pressure gauges, and an isolated quick build-up feature incorporated into the secondary reservoir system.

The air system shall utilize wire-reinforced type hose or TYPE K copper tubing with long shoulder fittings, throughout the system. The apparatus builder to submit a schematic of the system for evaluation with the bid.

Synflex, nylon or plastic brake line is not acceptable in any part of the apparatus brake system. Plastic will be acceptable in pneumatic accessories.

3-11.5. BRAKE LINES:

Stainless steel braid hose shall be used on the air line to/from the brake chambers to the frame bulkhead fittings. The hoses should be of sufficient length not to interfere with tire rotation on severe steering cramp angles or interfere with the rear axle.

3-11.6. AIR INLET WITH AUTOMATIC EJECT:

An air inlet system shall be provided. It shall allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet shall have a Air Eject device which automatically disconnects the air line when the truck is started. A check valve shall be provided to prevent reverse flow of air. The inlet shall discharge into the "wet" tank of the brake system. Mating side of eject device shall be provided. Inlet shall be located on the drivers side of the cab body, at the front of the cab. Auto-Eject shall be Kussmaul "super 30 air-electric auto-eject" combination electric and air connection. Trim color to be determined at pre-construction conference.

A backup inlet shall be installed for use in the event of failure of the Kussmaul inlet. The backup inlet shall be a standard male air quick-coupling with dust cap. Location to be determined at pre-construction conference.

3-11.7. AIR OUTLET:

Three (3) auxiliary air outlets shall be provided.

One air outlet shall be installed with a stainless steel female coupling and shut off valve on the on the right side pump panel, and one on the left side pump panel. These outlets shall be labeled "AIR". The valve handles shall be of similar style and appearance to other valves on the pump panel.

There shall be one air outlet with female coupling installed inside the cab, exact location TBD at pre-construction meeting.

This system will tie into the wet tank of the brake system and include an 85 psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

3-11.8. AIR COMPRESSOR:

The compressor shall be water cooled, oil lubricated, and directly driven by the apparatus engine. If belt-drive is used, the pulley shall be double sheaved, the diameter of the pulley shall meet OEM specifications, and shall not be changed to alter recovery performance.

A minimum of 16.1 CFM compressor will supply the air system. NO EXCEPTION TO THIS REQUIREMENT.

3-11.9. AIR DRYER:

A BENDIX-WESTINGHOUSE A System Saver 1200 (or latest version) air dryer with automatic moisture ejector shall be incorporated into the air system and be mounted in an accessible area suitable for servicing, but remaining protected from road hazard damage.

3-11.10. BRAKE SYSTEM VOLUME:

The brake system shall have a total air system capacity of not less than 4,100 cubic inches.

3-11.11. PARKING/EMERGENCY BRAKE:

The system shall use a positive spring actuated type on the rear wheels only, and to be controlled by loss of air pressure in the system or a control valve in the apparatus cab. Automatic spring-brake application shall be set at 40 psi.

The control valve in the cab shall be located to the RIGHT side dash of the driver, and easily reached from a normal driving position. The valve shall be labeled, "PULL TO SET" and "PUSH TO RELEASE" and actuated in the same manner. A yellow control knob shall be easily distinguished from other knobs on the dashboard and have a red indicator light showing when emergency brakes are set.

3-11.12. AIR RESERVOIRS - GENERAL:

The reservoirs shall meet or exceed SAE standards for air tank design and be mounted safe from road hazard damage. All reservoirs shall be equipped with easily accessible, manual 1/4 turn ball-type valves.

The total system shall be equal to or greater than fifteen (15) times the rated air volume of all service brake chambers.

3-11.13. ADDITIONAL AUTOMATIC MOISTURE EJECTORS:

There shall be additional heated moisture ejectors installed in the brake system. One (1) moisture ejector will be provided on each supply reservoir.

3-11.14. ALL WHEEL LOCK-UP:

An all wheel lock-up system shall be installed which will apply air to the front brakes and use the spring brake at the rear. Air shall be regulated not to exceed 85 psi.

1-12. Steering

3-12.1. A Ross TAS-85 steering gear or equivalent, with integral heavy duty power steering, shall be provided. The power steering will incorporate a hydraulic pump

with integral pressure and flow control. Steering stall at idle shall be terms for rejection.

The steering wheel shall be capable of tilting and telescoping. The steering wheel shall be padded.

1-13. **Wheels / Tires**

3-13.1. **WHEELS/TIRES:**

Front tires shall be radials 385/65R22.5, 18 ply G296 tread. The tires shall be mounted on 22.50" x 12.25" aluminum disc-type wheels with a ten (10) stud 11.25" bolt circle and 10 hole vent pattern (Alcoa). Finish on wheels shall be bright, clear coated, and shall be furnished with "baby moon" covers.

Rear tires shall be four (4) radials 12R22.50, 16 ply highway G287tread. The tires shall be mounted on 22.50" x 8.25" aluminum disc-type wheels with a ten (10)-stud 11.25" bolt circle. (Alcoa) Finish on wheels shall be bright, clear coated, and shall be furnished with "baby moon" covers.

1-14. **Cab:**

3-14.1. **CAB CONFIGURATION - GENERAL:**

The cab used shall be a cab specifically custom to fire apparatus use, designed and built by a recognized builder of fire apparatus and/or recognized manufacturer of custom cab/chassis for fire apparatus.

Crew cab shall be of the totally enclosed design, with access doors constructed in the same manner as the driver and passenger doors.

All cab configurations shall be of standard and/or basic feature models unless specific features and/or requirements are required as outlined below.

The apparatus builder shall reserve the option to supply a bid to reflect different cab configurations, where multi-line cab configurations are available to meet all of the requirements of this specification. Commercial cab/chassis configurations are not acceptable for this specification.

The cab shall be constructed of aluminum, galvaneal steel, or equivalent strength compatible materials necessary to withstand normal fire service use and operation for a minimum of 20 years.

Cab height shall not exceed an overall height of 120" including light bar and appurtenances.

Cab may have flat or raised roof design, with top of cab as closely matched to body height as possibly, while observing overall maximum height listed above.

Cab shall be a full tilt design, allowing easy maintenance of the engine compartment. The engine shall be accessible when the cab is tilted and the engine shall also be removable when the cab is tilted.

Provisions for checking the engine and transmission oil shall be provided on the engine tunnel and must be accessible without tilting the cab.

3-14.2. CONSTRUCTION

Should the construction of the cab be aluminum it shall consist of high strength 5052 .1875 " or greater aluminum welded to extruded aluminum framing.

Cab and crew cab front doors shall be a minimum 30.00" wide x 60.00" high. Rear doors shall be maximum size possible while maintaining overall length requirements.

Crew cab doors shall be located on the side of the cab.

Cab doors shall be constructed of aluminum or steel with a double pan design and contain an electric roll down window.

Cab and crew cab shall be designed to optimize room and allow complete visual and audio communications between all fire fighters.

The engine tunnel shall be constructed out of aluminum or steel and will be tapered at the top to allow for more driver and passenger elbow room.

The engine hood shall be insulated for protection from heat and sound. The noise insulation shall keep the DBA level within the limits stated in the current NFPA series 1900 pamphlet and Section 2-14 of this specification.

Circular, bolted on, inner fender liners in the wheel wells shall be provided.

The outside rear wall of the crew cab shall be covered with a bright aluminum treadplate panel.

The cab shall be covered by a ten year structural warranty.

3-14.3. SPECIFIC PROVISIONS - CAB CONSTRUCTION

All cab configurations shall be adequately designed and constructed to reduce the transfer of engine noise and heat conducted directly into the cab area.

3-14.4. CAB ELECTRICAL - GENERAL

All cab electrical equipment, switches, gauges and accessories used and installed by the apparatus builder shall be of a recognized automotive brand, heavy duty quality and be commercially available for replacement.

All electrical wiring shall be sized to carry 125% of the maximum ampere load for which the circuit is protected and meet or exceed S.A.E. specification J1128.

All wire circuits shall be individually color-coded and/or number-coded labeled at minimum six (6) inch intervals and within a fabric protective loom securely bracketed a minimum of twelve (12) inches apart.

All circuitry shall be adequately protected from overloading physical damage and centrally located in one (1) common area that is also adequately isolated and protected from high voltage spiking.

3-14.5. MULTIPLEX WIRING SYSTEM

3-14.5.1 General

Apparatus shall be constructed with a multiplex wiring system which conforms to the recommendations set forth in NFPA 1901 (most recent edition).

The intent of specifying a multiplex wiring system is to allow maximum flexibility of the vehicle and its controls, allow for future changes to functionality of the control configuration, reduce overall number of wires and electrical connections on apparatus, and provide an easy-to-use interface for the equipment operator.

All equipment shall be installed consistently with the multiplex hardware manufacturers recommendations and shall be designed and rated by the manufacturer for fire service use. Components located on exterior of vehicle shall be waterproof.

3-14.5.2 Control Hardware

All control hardware shall be installed consistently with the manufacturers recommendations and shall be mounted with due consideration for vibration, exposure to water and road debris. All modules and nodes shall be located such that any unit can be reasonably accessed for inspection, service or replacement. Control hardware shall utilize positive-locking, waterproof electrical connections. **Output modules shall be solid-state (shall not be electro-mechanical relays).**

3-14.5.3 Interface Equipment

Primary multiplex interface shall be with one (1) touch screen. Touch screen shall be color liquid crystal touch-sensitive type display. Screens shall be configured with programmable buttons arranged on periphery of screen to

act as redundant control in the event that touch screen fails or user is unable to use touch screen due to gloved hands, presence of dirt, water etc. The screen shall be mounted in cab within easy reach of the driver.

All user-interface switches utilized throughout the apparatus shall integrate into the multiplex control system.

Programming of control menus shall be intuitive in design and shall take into account the most commonly used features. System shall use action-based automatic page flips (i.e.: backup camera automatically displayed when vehicle is placed into reverse gear).

3-14.5.4 Information to be displayed

Interface panel mounted in cab shall be capable of displaying/controlling all of the following (minimum examples):

- Backup camera (shall be activated automatically when vehicle is placed in reverse gear)
- All scene lighting
- All emergency warning lighting
- Seatbelt status of cab occupants (optionally, a separate seatbelt status display may be implemented)
- Cab climate control
- Cab door status (open/closed)
- Body compartment door status (open/closed)
- Ladder arm status (if applicable)
- Engine, transmission and chassis data etc. (for service purposes)

3-14.5.5 References

References to three (3) departments featuring similar multiplex systems implemented on fire apparatus by bidder shall be provided. References shall be to departments as close (geographically) to La Honda as possible, and shall all be within California.

3-14.5.6 Warranty

All multiplex wiring and control system hardware shall be covered by the multiplex equipment manufacturers warrantee for a minimum of five (5) years.

3-14.5.7 Reprogramming

The installed multiplex wiring system shall be capable of receiving programming upgrades without the need for a service technician to directly access the apparatus. This may be accomplished by having USB, Wifi, or other program upload capability allowing the Purchaser to upload programming changes provided by the manufacturer post-delivery.

The manufacturer shall provide up to 3 programming changes (to be remotely uploaded as specified above) to the multiplex software at no additional cost to the Purchaser.

3-14.5.8 Software/Accessories

The following shall be provided with apparatus:

- Copy of multiplex program as delivered, on USB drive or similar
- Programming software for multiplex system
- Interface cable required to program multiplex system

3-14.6. CAB ELECTRICAL, SPECIFIC PROVISIONS

The apparatus shall be wired to provide appropriate electrical circuits within the cab (location to be determined at pre-construction meeting) for the following accessories:

- convenience outlets (detailed below)
- 4 portable radio chargers (purchaser supplied, manufacturer installed)
- TIC charger (purchaser supplied, manufacturer installed)
- Gas monitor charger (purchaser supplied, manufacturer installed)
- 2 light box chargers (purchaser supplied, manufacturer installed)
- i-Pad mount/charger (purchaser supplied, manufacturer installed)

Additionally, the apparatus shall have near each seated position a full time hot and a switched power, PREWIRING ONLY, to supply buyer installed accessories.

Front headlights shall be four (4) JW Speaker 8800 series rectangular LED headlights, two mounted on each side of the apparatus.

Four (4) convenience outlets of the 12volt cigarette lighter style and Four (4) Kussmaul 091-219 USB dual charging ports shall be provided. Locations to be determined at pre-construction meeting. Convenience outlets shall be wired to be full-time hot (not affected by vehicle kill switch).

Five (5) LED clearance lights and marker lights shall be installed above the windshields.

The cab shall be equipped with one (1) 6" Whelen Pioneer PCP2 combination LED spotlight/floodlight mounted as brow-light directly above the center of the windshield. Light shall be installed on a Whelen cab-specific bracket. Controls for light shall be inside the cab.

The cab shall be equipped with a Go-Light LED remote control searchlight mounted to the roof of the cab. Placement and color of the light shall be determined at pre construction conference.

3-14.7. EMERGENCY WARNING

All emergency warning devices shall have the controls centrally located mounted on a separate removable panel installed in a position within reach of the driver in a normal

driving position and appropriately labeled and legible at a glance. A master warning light switch and individual switches shall be provided to allow pre-selection of emergency lights. The light switches are to have an integral light to show when switch is energized. Such function can be supplied by a Federal Signal Smart Siren control head or equivalent.

The emergency warning system shall include provisions for alternating headlights on the high beam only.

The air horns, (recess bumper mounted), shall have three (3) controls. There shall be 2 pull-cord type switches located on the headliner of the drivers and captains seat area. Exact placement of the pull-cords shall be determined at pre construction meeting. The third switch shall be a switch located on the pump panel. This switch shall be Labeled "AIR HORN" and shall be a distinctly different color from other switches on the pump panel.

3-14.8. DOORS

The cab doors shall be designed and constructed to have replaceable and/or accessible features of the door, window and door hinge hardware, without reducing the strength or durability of the door.

The doors shall be mounted with minimum 1/4" pin diameter stainless steel continuous piano hinge, fully adjustable and equipped with provisions to limit opening of the door without subjecting cab, or mirror hardware to damage.

The doors shall be equipped with adjustable windows and have access panels to hardware. The panels shall be fastened with a replaceable fastener such as rivet type NUTSERT or equivalent. No self - tapping screws or bolts are acceptable.

Flush mounted, paddle type door handles shall be provided on the interior and exterior cab and crew cab doors.

The doors shall be equipped with a heavy duty closed cell weather stripping around the perimeter of the door and rain gutter above the door.

All interior door hardware shall be operable from a normal driving position.

The cab shall have provisions for automatic illumination of the cab entry step area upon opening the door.

All doors shall be equipped with stainless steel kick plates. The plates shall cover the full width of the interior side of the door. The plates shall extend 12" from the bottom of the door.

Each door shall be equipped with a warning light mounted to the interior surface of the door the purpose of warning traffic when the door is open. Light shall be mounted in the outer lower corner. Lights shall be Whelen OS series red LED marker lights with chrome bezel. Lights shall turn on automatically when doors are open and shall flash when activated.

3-14.9. GLASS

The cab windshield shall be installed utilizing modern automotive techniques, and trimmed in rubber.

The windshield shall be two piece design and provide maximum visibility from 10 feet in front of the apparatus to 15 degrees above the horizon.

All glass used on the apparatus shall be safety glass and tinted type where allowed.

Electric windshield wipers shall be provided that meet FMVSS and SAE requirements. One control shall operate both wipers. The wiper control shall be two (2) speed (high and low) and feature an intermittent control. The control shall also have a "return to park" provision (toward center of cab). The wipers shall have a pantographic design for covering a large sweeping area.

Each wiper shall be equipped with a wet arm washer that is actuated by the wiper control.

The windshield shall be equipped with interior visors and wiper provisions for at least 70% of the surface.

Wash reservoir shall be able to be filled without raising the cab.

3-14.10. CAB DASH/CONTROLS - GENERAL:

The cab dash shall be designed to incorporate all controls and/or gauges for vehicle functions but independent of the emergency warning controls.

The dash controls including any below dash level controls shall be appropriately labeled and operable from a normal driving position.

The dash gauges shall be directly adjacent to the line of sight of the driver in a normal driving position and appropriately labeled and legible at a glance.

The dash and windshield sill area shall incorporate a non-reflective surface finish and/or material.

3-14.11. GRILL:

A grill assembly, consisting of polished stainless steel shall be installed and serve as an air intake to the radiator. It shall not restrict adequate cooling air flow to the radiator.

3-14.12. CAB FLOOR:

The cab and crew cab flooring shall be covered with a heavy duty rubber matting.

3-14.13. CAB WINDOWS:

Within each door of the cab, a window, shall be provided. Windows shall fully roll down, and shall be electric type. Rear doors shall feature tinted glass. Each electric window shall be controlled from the corresponding seated location, and there shall be a set of master controls for all 4 windows located within reach of the drivers position.

3-14.14. CAB DOOR HARDWARE

Cab doors shall feature door handle/latches either of the paddle or pull-handle type. If paddles are selected, paddle handle shall be sized to easily accommodate a gloved hand. Regardless of handle style, all hardware shall be either bright chrome or polished stainless steel, and shall be locking and keyed alike.

3-14.15. FENDER CROWNS:

Stainless steel fender crowns shall be installed at cab wheel openings. They shall be independently removable/replaceable.

3-14.16. CAB LIFT:

Tilt cab configurations shall incorporate either an electric over hydraulic or an air over hydraulic lifting device with provisions to manual override system and positive locking features.

The hydraulic pump shall have a manual override for backup in the event of electrical / air failure.

Cab is to be locked down by a two point automatic spring loaded hook mechanism that actuates after the cab has been lowered.

The hydraulic cylinders shall be equipped with a velocity fuse which protects the cab from accidentally descending when the control is located in the tilt position.

Cab lift controls shall be located to the rear of the cab or the passenger side pump panel.

3-14.17. MIRRORS:

Two, (2) Retraco model 613425 Dual Vision, lighted, motorized mirrors with chrome backs. Mirrors shall be mounted on stainless steel tubular mounts. Both mirror heads shall be adjustable by an electric remote control switch inside the cab within easy reach of the driver. The mounting location of the motorized mirror controls shall be determined at the pre-construction meeting.

3-14.18. CAB INTERIOR:

The door panels shall be covered with stainless steel resistant to scratching, impact and easily cleanable.

The cab dash fascias shall be a wrap-around design to provide easy access to controls.

The headliner shall be installed in both forward and rear cab sections. Headliner material shall match the material selected for the seats in both style and color. It shall have a sound barrier as part of its composition.

The forward portion of the cab headliner shall provide easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit.

3-14.18.1 INTERIOR UPHOLSTERY:

The cab interior upholstery shall be dark grey or black. All upholstered surfaces shall be of the same fabric material as the seats ("Turnout Tuff" material)

All non-stainless steel metal surfaces inside the cab shall be dark grey or black.

3-14.18.2 MAP BOOK STORAGE BOX

There shall be a box for storage of map books and other miscellaneous paperwork. Box shall be sized to accommodate 5 standard 3" 3-ring binders (minimum), and shall have one additional storage area for various writing pens, pencils etc. Box shall be located to provide convenient access from captains seated position. Exact location and design to be determined at pre-construction conference.

3-14.18.3 CREW STORAGE COMPARTMENT:

2 small compartments shall be provided in the crew area to store small personal items. Size and location TBD at pre-construction meeting,

3-14.19. SEATING - GENERAL:

All seating shall be of design dimensions for persons, from 5'6" to 6'6" in full turnout clothing, to be seated safely and comfortably, unless specific dimensions are outlined.

All seating shall be equipped with FMVSS approved adjustable and retractable 3 point type seat belts with adequate lengths and accessibility for use in full turnout clothing and when an SCBA is donned (where applicable).

All seat upholstery shall be high strength, wear resistant, and waterproof nylon fabric. Vinyl upholstery shall not be used. Color shall be black or dark grey.

All Seats Inc. 911 SCBA mount type seats shall come with padded back rest inserts (where applicable). All SCBA seats shall be furnished with a face mask storage pouch mounted in a convenient location.

3-14.19.1 NUMBER OF SEATS:

The total number of seats in the cab and crew cab shall be six (6) .

3-14.19.2 DRIVERS SEAT:

The drivers seat shall be a Seats Inc. 911 Battalion Air Ride seat, mounted in the center of the steering wheel but complying with the minimum adjustment dimensions of 40" headroom clearance at lowest most position and 20" clearance, steering wheel to seat back at forward most position.

3-14.19.3 OFFICER'S SEAT:

A Seats Inc. 911 battalion officer seat with front-release SCBA system shall be provided in the cab for the officer. The seat shall be equipped with an SCBA provision.

3-14.19.4 SEATING - CREW CAB:

The seating and seating area clearance shall be of the design dimension to don the SCBA in full turnout clothing safely without being unseated or requiring unfastening of the seat belt restraints. The minimum acceptable dimensions are: 20" thigh room, 40" head room, 24" seat depth to seat back.

There shall be two (2) Seats Incorporated 911 Battalion crew flip seats equipped with front cushion SCBA release. These seat shall be rear facing on the outboard positions.

Two(2) seats shall be forward facing in the center position against the back wall of the cab, a minimum of 12" apart. These seats shall be non-SCBA, flip-down style seats. Upholstery shall match the other specified seats.

3-14.19.5 AIR BOTTLE HOLDERS:

All seats specified with SCBA holders shall be equipped with Ziamatic EZ-LOC brackets with front release option on bottom cushion.

3-14.20. CAB SAFETY SYSTEMS

The cab shall be equipped with the following safety features (minimum)

- Front crash airbags
- Side impact airbags
- Seatbelt pre-tensioners

These systems shall be compliant to NFPA 1901 (current edition) standards.

3-14.21. INTERIOR CAB LIGHTING:

3-14.21.1 ENGINE COMPARTMENT LIGHT:

An engine compartment light shall be installed under the engine hood with integral switch.

3-14.21.2 CAB INTERIOR LIGHTING:

Auxiliary lights shall be provided in the cab and consisting of:

- A dome light, controlled by automatic door switches

- A courtesy light at each door opening, controlled by automatic door switches
- One (1) Suntex gooseneck light in area of captain's seated position.

3-14.21.3 CREW CAB INTERIOR LIGHTING:

Auxiliary lights shall be provided in the crew cab and consisting of:

- Two (2) clear dome lights, one each side, controlled by automatic door switches.
- A courtesy light at each door opening, controlled by automatic door switches

3-14.22. CAB HEATER/AIR CONDITIONING:

There shall be a 35,000 BTU (MINIMUM) heater in the cab. All heater hoses shall be silicone type. The heater ducts shall be vented in a manner to provide heat directed towards the seated positions. The defroster ducts shall be designed to provide maximum defrosting capabilities for the windshield. Defroster louvers shall be provided for directing air flow to the side cab door windows.

There shall be an Air Conditioner rated at a minimum of 40,000 BTU, Location of vents TBD at Pre-construction meeting.

The heater and air conditioner may be a combination unit.

3-14.23. CAB INSTRUMENTATION:

Instrument panel controls and switches shall be identified as to its function by imprinted word(s) adjacent to the switch. Actuation of the headlight switch shall illuminate ("back light") wording for after dark operation. Turn signal and high beam headlight indicator lights shall be also provided.

To avoid confusion, warning indicators shall be (where possible) the "dead front" type, meaning the warning light and word identification of same does not show up unless it is necessary.

Instrument panel gauges, vehicle lights and other electrical accessories shall use proper sized wiring to accommodate expected current load. All wiring shall meet SAE J-1128 specifications for high temperature (250 degrees F. min.) conditions and shall be color, number and function coded.

Cab instruments and controls shall be conveniently located within the forward cab section.

Gauges and emergency vehicle switches shall be installed on removable panels for ease of service.

The dash shall be equipped with but not be limited to the following features and controls:

- One (1) speedometer with odometer.
- One (1) electronic tachometer.

- One (1) ammeter.
- One (1) voltmeter
- One (1) fuel gauge.
- One (1) engine oil pressure gauge.
- One (1) engine coolant temperature gauge.
- Two (2) air pressure gauges for air brake system. (Alternate; provide a dual needle air pressure gauge.)
- One (1) engine hour meter, oil pressure activated.
- One (1) transmission temperature gauge.
- One (1) ignition switch.
- One (1) starter button.
- One (1) master electrical switch (250 amp capacity relay or shunt to be incorporated).
- One (1) headlight / tail light / clearance light three (3) position switch and high beam indicator light.
- One (1) windshield wiper switch.
- One (1) heater defroster switch.
- One (1) audible warning device and three (3) visual lights for low air system pressure, low engine oil pressure, and high engine coolant temperature, mounted adjacent to each gauge.
- One (1) I.C.C. four way flash control switch (if not integral with the steering column mounted turn signal controls)
- Four (4) spare switches, two (2) battery, two (2) ignition.
- One (1) pick-up/back-up lights switch.
- One warning light switch control panel.
- Inverter On/Off switch
- Jacob's engine brake on / off switch and high / medium / low switch.
- Controls for one (1) fresh air heater/defroster/Air Conditioner
- One (1) self-canceling directional signal control, steering column mounted.
- One (1) control for dome lights.
- Dash mounted map light in the officers compartment.
- One (1) records storage compartment. Location and size TBD at pre-construction meeting
- FRC "cab mini" Water and foam level indicators

3-14.24. INTERCOM SYSTEM

Installed in the vehicle shall be a Firecom wireless intercom system consisting of one (1) model UHW-51 wireless headset mounted in the drivers position, One (1) UH-51 wired headset in the officers position, and two (2) model UHW-54 wireless headsets mounted in the passenger seating area. Specific mounting locations to be determined at pre-construction meeting. Headsets to store on ceiling hangers. Location to be determined at pre-construction

conference. Charge ports for wireless headsets shall be located within vicinity of storage hangers.

3-14.25. MOBILE RADIOS

The following mobile radio equipment, complete with antennas, cable etc, shall be provided to builder by the Purchaser for installation in the apparatus by the manufacturer:

- 2 Kenwood TK-890 (or similar) VHF Radios
- 1 Kenwood KDS-100 Mobile Display Terminal
- 2 spare antenna bases with cabling to be placed at the direction of the Purchaser and pre-wired to radio console for future use.

3-14.26. HELMET HOLDERS

No Helmet storage/holders shall be provided by manufacturer. NFPA compliant helmet holders will be installed by Purchaser after delivery of apparatus.

3-14.27. ENGINE COMPARTMENT:

The engine compartment shall be designed relative to the cab/frame configuration used and shall have the provisions for the following functions, WITHOUT ANY MAJOR DISASSEMBLY OR REMOVAL OF LARGE BODY/CAB PANELS:

- Checking of essential engine levels; such as oil level, coolant level or overflow reservoir, transmission fluid level, power steering reservoir level.
- Visual inspections of; all belt driven engine accessories, air filter restriction gauge (if applicable to location).

Access panels are acceptable but shall have provisions for removal from the outside of the panel, without the use of a second tool. Every effort shall be made to use an easily replaceable device to secure panels, such as rivet style NUTSERTS. NO WELDED NUTS. Self-tapping screws, self-threading cap screws are NOT acceptable. NO EXCEPTIONS.

The engine compartment shall be fully insulated as the O.E.M. design will allow, but the apparatus builder shall make every effort to minimize engine heat and the engine noise being transferred into compartments occupied by personnel, as required in the section of this specification for operating noise level standards.

The engine compartment shall not terminate air flow or regenerate heat toward any personnel occupied compartment.

1-15. Apparatus Body Electrical - 12 Volt:

3-15.1. GENERAL:

All 12 volt electrical equipment installed by the apparatus manufacturer shall conform to modern automotive practices and all applicable Federal standards and to all standards as outlined in NFPA # 1901. All wiring shall meet SAE Specification J1128 and NFPA #1901 and shall be a minimum 12 gauge, high temperature crosslink type stranded copper with a rated capacity of 125% of the maximum ampere load for which the circuit is protected. Wiring to be run in loom or conduit where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers shall be provided which conform to SAE Standards. Wiring to be color, function and / or number coded. Function and / or number codes shall be continuously imprinted on all wiring harness conductors at 6.00" intervals. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment shall be installed utilizing the following guidelines:

- 3-15.1.1 All holes made in the roof shall be caulked with silicone.
- 3-15.1.2 Any electrical component that is installed in an exposed area shall be mounted in a manner that will not allow moisture to accumulate in it. Exposed area is defined as any location outside of the cab or body.
- 3-15.1.3 Electrical components designed to be removed for maintenance shall not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire shall be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
- 3-15.1.4 Corrosion preventative compound shall be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections shall require this compound IN the plug to prevent corrosion and for easy separation (of the plug). All electrical terminals in exposed areas shall have silicon (1890) applied completely over the metal portion of the terminal
- 3-15.1.5 All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.
- 3-15.1.6 All light switches are to be "rocker" type with an internal indicator light to show when the switch is energized. All switches shall be identified by either printing or etching on the switch panel. The switches and identification shall be illuminated.
- 3-15.1.7 All lights and reflectors required to comply with Federal Motor Vehicle Safety Standard #108 must be furnished. Rear identification lights to be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads shall be protected from damage by installing a false bulkhead inside the rear compartments.

3-15.1.8 An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests shall be recorded and provided to the purchaser at time of delivery.

3-15.2. MULTIPLEX WIRING SYSTEM

Apparatus shall be equipped with a multiplex wiring system. System shall comply with all applicable NFPA 1901 (most recent addition). Specific requirements of multiplex wiring system located in section 3-14.5.

3-15.3. LIGHTING:

Exterior lighting shall meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at time of proposal. All exterior lighting shall be LED, no incandescent lamps shall be used.

3-15.4. STOP TAIL, REVERSE AND DIRECTIONAL LIGHTS:

The rear stop/tail lights shall be rectangular red Whelen M6BTT lights.
Rear directional lights shall be rectangular amber Whelen M6T lights.
Reverse lights shall be rectangular white Whelen M6BUW lights.

Lights shall be mounted on the rear face of the rear fender compartment, and shall be contained within a single 4-gang chrome trim ring to include rear emergency red warning light of same series (Whelen M6FCV4).

3-15.5. "DO NOT MOVE APPARATUS" INDICATOR:

A flashing red indicator light (located in the driving compartment) shall be illuminated automatically when the vehicle's parking brake is not fully engaged, and any passenger/equipment door is open, or the ladder rack is down. The light shall be labeled "Do Not Move Apparatus If Light Is On". Light shall be Whelen OS series red LED.

3-15.6. OPEN DOOR INDICATOR LIGHT:

Two (2) red indicator lights shall be provided and located in clear view of the driver, warning of an open passenger or equipment compartment door. Light shall be Whelen OS series red LED.

One (1) light shall indicate status of doors on the driver's side of the vehicle and one (1) light shall indicate the status of the passenger side and rear compartment doors. Light shall be Whelen OS series red LED.

3-15.7. COMPARTMENT LIGHTING:

A light shall be provided in each enclosed compartment sized to illuminate that compartment. Opening the compartment door shall automatically turn compartment

lighting on. Lights shall be LED strip-light type, mounted on outer body surface or roll-up door tracks, illuminating inward.

3-15.8. PUMP COMPARTMENT LIGHT:

A pump compartment light shall be provided inside the right side pump enclosure and accessible through a door on the pump panel.

3-15.9. PERIMETER SCENE LIGHTS:

The apparatus shall be equipped with ground area lighting provided in compliance with NFPA 1901 requirements.

The lights shall be located one (1) under each cab and crew cab door, one (1) under each pump panel running board and one (1) each side under rear platform. All ground lighting shall utilize LED illumination, no incandescent lamps will be acceptable.

3-15.10. DECK LIGHTS:

Two (2) Whelen Pioneer PCPSM1C Surface-Mount 12V, shall be installed on the rear surface of the rear compartments adjacent to the main hosebed, one (1) each side, mounted as high as possible. Lights shall be recessed in to the compartment such that the face of the light and trim ring (if used) are ¼" recessed from the rear surface of the compartment. Both lights shall be switched (together) from the cab, and from a switch located at the rear apparatus.

3-15.11. TELSCOPING LIGHTS

Two (2) Whelen Pioneer PCP3P1 LED combination flood/spot light with handle (12V) lights shall be installed on Whelen 3000 series telescoping mounts on either side of the apparatus. The lights shall be mounted to the rear of the cab. When in the stowed position, the lights shall not extend above the cab roofline, and shall not extend outward from the side of the cab. When in the extended position, the lights shall be capable of facing directly outward from the side of the vehicle to allow them to be immediately functional as scene lighting without the need to extend or adjust the lights. Mounts shall be extendable 20' upward (minimum) from the stowed position and shall be operable from the bottom of the pole. Light head shall be able to rotate 360° in extended position, and shall have a bracket that allows for vertical angle adjustment. Controls for lights shall be located in both the cab and on the pump panel. The lights shall be equipped with a cradle in which the pole rests in when stowed, containing a switch wired to the "do not move apparatus" warning system.

3-15.12. ELECTRICAL POWER CONTROL SYSTEM:

A compartment shall be provided in or under the cab to house the vehicles electrical power and signal circuit protection and control components. The power and signal protection and control compartment shall contain circuit protection devices, power control devices, and a programmable logic controller, should one be provided. Power

and signal protection and control components shall be protected against corrosion, excessive heat, excessive vibration, physical damage and water spray.

Serviceable components shall be readily accessible.

Circuit protection devices which conform to SAE and NFPA standards shall be utilized to protect each circuit. All circuit protection devices shall be sized to prevent wire and component damage when subjected to extreme current overload.

Power control relays and solenoids shall have a direct current (DC) rating of 125 percent of the maximum current for which the circuit is protected.

3-15.13. INDICATOR LIGHT AND ALARM PROVE-OUT:

A system shall be provided which will automatically test indicator lights and alarms located on the cab instrument panel when the ignition switch is activated. Provisions shall be provided to allow a manual retest when the ignition switch is "on" and before the parking brake is released or the PTO is engaged.

3-15.14. VOLTAGE MONITOR SYSTEM:

A voltage monitor system shall be provided to indicate the status of each battery system connected to the vehicle's electrical load. The monitor system shall provide visual and audio warning when the system voltage is above or below optimum levels.

Two (2) alarm stages shall be provided. The first stage will activate intermittently if the system falls below 11.8 VDC or rises above 15 VDC. The second stage alarm will activate continuously if the system voltage falls below 11.3 VDC or rises above 16 VDC. Input voltages shall be conditioned to avoid nuisance alarms.

3-15.15. POWER AND GROUND STUD:

A 12 volt power stud and a grounding stud shall be provided in the electrical component compartment for two-way radio equipment. This shall be wired to minimize voltage drop and interference from other devices.

3-15.16. EMI/RFI PROTECTION:

The apparatus shall be designed with components to insure radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source. The apparatus shall have the ability to operate in the electromagnetic environment typically found in fire ground operations. The contractor shall demonstrate that EMI and RFI testing has been done on this or similar apparatus and certify that the vehicle proposed meets SAE J551 requirements.

EMI/RFI susceptibility shall be controlled by applying immune circuit designs, shielding, twisted pair wiring and filtering. The electrical system shall be designed for full compatibility with low level control signals and high powered 2-way radio

communication systems. Harness and cable routing shall be given careful attention to minimize the potential for conducting and radiated EMI-RFI susceptibility.

3-15.17. BATTERY SYSTEM:

A single starting system shall be provided, utilizing six (6) 12 volt, high cycle, group 31 batteries.

An ignition switch and starter button shall be located on the instrument panel.

A master battery switch shall be installed in a convenient location for the driver.

An indicator light shall be provided on the instrument panel to notify the driver of the status of the battery system.

3-15.18. MASTER BATTERY SWITCH:

A master battery switch to activate the battery system shall be provided inside the cab within easy reach of the driver.

3-15.19. BATTERY COMPARTMENTS:

Batteries shall be placed on non-corrosive mats and stored in a single well ventilated compartment.

Heavy duty, 3/0 gauge, color coded, battery cables shall be provided. Battery terminal connections are coated with anti-corrosion compound.

3-15.20. BATTERY CHARGER:

A Kussmaul AC 35/10 (furnished with bar graph display) charger shall be provided. The charging unit itself shall be located an appropriate location per manufacturers recommendations. The remote display shall be located on the exterior of the apparatus near the charge cable inlet.

3-15.21. AUTO-EJECT RECEPTACLE:

An auto eject receptacle shall be installed to supply 120 volts to the battery charger. The battery charging outlet shall be mounted on the driver's side of the cab. The Auto-Eject shall be connected to the vehicle start buttons. The cord end shall be provided with the apparatus. Auto-Eject shall be Kussmaul "super 30 air-electric auto-eject" combination electric and air connection. Trim color to be determined at pre-construction conference.

3-15.22. ALTERNATOR:

A C.E. Niehoff, model N 1222-5, or equivalent Leese Neville alternator shall be provided. It shall have a minimum rated output current of 270 amp as measured by SAE method J56. Also it will have a custom three (3)- set point voltage regulator. The alternator shall be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

3-15.23. AMP DRAW REPORT:

An itemized print out of the expected amp draw of the entire vehicle's electrical system shall be included with this bid. This shall be required so that it can be verified that the alternator capacity requested is adequate for the vehicle's electrical system.

The duty cycles used for generating this report shall be customized (if necessary). The report shall list the amp draw when the vehicle is in the "responding" and "on scene" modes.

3-15.24. ELECTRONIC LOAD MANAGEMENT:

A Kussmaul , Class 1 or equivalent electronic load management (ELM) system should be provided which monitors the vehicles 12-volt electrical system, and automatically reduces the electrical load in the event of a low voltage condition and by doing so, ensures the integrity of the electrical system.

The ELM monitors the vehicle's voltage while at the scene (parking brake applied). It shall sequentially shut down individual electrical loads when the system voltage drops below a preset value. The ELM will sequentially re-energize electrical loads as the system voltage recovers.

3-15.25. WATER AND FOAM LEVEL INDICATOR SYSTEMS

3-15.25.1 Water level indicator shall consist of the following components:

- FRC WLA200-A00 main display, located on pump panel
- FRC WLA205-A00 mini display located in cab
- Two (2) FRC "Max Vision" programmable LED Tank Display. Units shall display booster tank level, shall be configured in the "ultra view" mode where entire LED light stick changes color with tank level, and shall feature automatic day/night intensity adjustment. Any necessary auxiliary driver hardware shall be included. Units shall be mounted one on each side of the apparatus cab at the direction of the Purchaser. Exact location to be determined at pre-construction conference.

3-15.25.2 Foam level indicator shall consist of the following components:

- FRC WLA260-A00 main display, located on pump panel
- FRC WLA265-A00 mini display located in cab

3-15.26. BACK-UP ALARM:

A NFPA compliant solid state electronic audible back-up alarm that actuates when the truck is shifted into reverse shall be provided.

3-15.27. BACK-UP CAMERA

A color backup camera system shall be installed to provide optimum rear-facing view. Camera shall be protected from accidental mechanical damage by rugged shroud or recessed

mounting. Camera image shall appear on Multiplex wiring control panel and shall be automatically activated when vehicle is placed into reverse gear.

3-15.28. HOT TERMINAL STRIP

A covered 12-volt full time hot terminal strip to provide power for medical equipment chargers shall be provided in the lower right rear compartment.

3-15.29. 12 VOLT OUTLETS (pre-wired):

A grouping of three (3) 12 volt receptacles shall be installed in a department specified compartment. Each individual outlet shall be protected with a circuit breaker (auto-reset type). Each receptacle shall be similar to a cigar lighter receptacle. Each receptacle shall be wired to provide power at all times, regardless of the master battery on/off switch position.

3-15.30. 12 VOLT HI CURRENT/JUMP-START OUTLETS

Two (2) 12-volt high current plugs shall be located in area of the rescue connections, one on either side of the apparatus. Outlets shall be of appropriate design, and wired to be capable of driving hi-current accessories such as electric capstan winches, and also be functional for providing jump-starts to other vehicles. Final location of the outlets TBD at pre-construction conference

One set of jumper cables shall be provided with the apparatus. Cable set shall consist of 25' length color-coded 1-AWG (minimum) welding wire, terminated with appropriately rated parrot clamps on one end and mating disconnect plug on the opposite end.

1-16. Electrical System Design For Alternating Current:

The following guidelines shall apply to the 120/240 VAC system installation:

3-16.1. GENERAL:

Any fixed line voltage power source producing alternating current (ac) line voltage shall produce electric power at 60 cycles plus or minus five (5) cycles.

Except where superseded by the requirements of NFPA pamphlet 1901, all components, equipment and installation procedures shall conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

Line voltage electrical system equipment and materials included on the apparatus shall be listed and installed in accordance with the manufacturer's instructions. All products shall be used only in the manner for which they have been listed.

3-16.2. GROUNDING:

Grounding shall be in accordance with NFPA pamphlet 1901, latest edition and Section 250 of NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors shall be used for grounding and bonding.

3-16.3. WIRING IDENTIFICATION:

All line voltage conductors located in the main panel board shall be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point. When pre-wiring for future power sources or devices, the unterminated ends shall be labeled showing function and wire size.

3-16.4. LISTING:

All receptacles and electrical inlet devices shall be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages shall be rated for the appropriate service.

3-16.5. ELECTRICAL SYSTEM TESTING:

The wiring and associated equipment shall be tested by the apparatus manufacturer or the installer of the line voltage system. All 120/240 volt electrical systems shall be tested in accordance with NFPA pamphlet 1901, 1999 edition or latest edition.

1-17. Inverter:

3-17.1. MAKE / MODEL:

Inverter shall be a Kussmaul Model 430-2000-5 or equivalent, rated at minimum 2000 watts continuous power, 4000 watts peak power, and featuring a true sine-wave output.

3-17.2. INVERTER LOCATION:

TBD at pre-construction.

3-17.3. INVERTER REMOTE ON/OFF:

Switch shall be located in cab as per section 3-14.23. No additional procedures shall be required to activate/deactivate inverter.

3-17.4. CIRCUIT BREAKER PANEL:

A circuit breaker panel shall be installed in a convenient location. A directory for each breaker shall be provided adjacent to the circuit breaker panel. Circuit breakers shall be of the GFI type. Identification of circuits shall be done in a durable manner. There shall be a main circuit breaker sized to carry 115 percent of capacity.

3-17.5. 20 AMP RECEPTACLES:

Wired to the power supply will be three (2) duplex receptacles that are 120 volt 20 amp three wire receptacles with weather resisting covers located per the direction of the fire department.

3-17.6. CORD REEL

One Hannay stainless steel live cord reel with electric rewind shall be mounted inside a compartment to be determined at the pre-construction meeting. Reel shall be equipped with 200' of black rubberized 10-3 cord, rated for such application. Free end of cable shall be terminated

with a 30amp rated twist-lock cord end. Cord reel shall be appropriately wired to apparatus 120V system in compliance with NFPA guidelines. Switch for electric rewind shall be located within the same compartment housing the cord reel. An Akron EJBX junction box with 30amp twist-lock input (or equivalent) and mounting bracket shall be included. Junction box shall be configured with 2 duplex 20 amp standard plug sockets.

1-18. Emergency Warning Lights And Warning Devices:

3-18.1. AIR HORN SYSTEM:

Two (2) air horns shall be provided and installed in the front bumper, recessed on the passenger side. The air horns shall be Grover model #1510. The air horn system shall be piped to the air brake system wet tank utilizing .38" tubing. A pressure protection valve shall be installed to prevent loss of air in the brake system. Air pressure shall be regulated to 85 psi.

3-18.2. AIR HORN CONTROL:

The air horns shall be capable of being activated from three (3) locations.

- There shall be 2 pull-cord type switches located on the headliner of the drivers and captains seat area. Exact placement of the pull-cords shall be determined at pre construction meeting.
- Pump panel. A momentary waterproof switch located on pump panel, exact location TBD at pre-construction meeting.

3-18.3. ELECTRONIC SIREN:

A electronic siren shall be provided. Siren head shall be Federal Signal Smart Siren control head or equivalent.

Siren head shall be located on a swivel bracket mounted on the headliner so that it is accessible to both the driver and officer. The swivel bracket shall be capable of rotating a minimum of 180 degrees.

Siren controller shall be wired to steering wheel horn ring switch, allowing siren activation and tone change from this switch.

3-18.4. SPEAKER:

One (1), 100 watt speaker shall be provided with the siren amplifier. Speaker shall be mounted recessed into the front bumper and protected by a chrome-plated or stainless steel grill.

3-18.5. HEADLIGHT FLASHER

The high beam headlights shall flash alternately between the left and right side, with a control switch located on the cab instrument panel.

Alternating function shall be controlled by a solid state electronic flashing module or by multiplex wiring control system utilizing solid state outputs. No electro-mechanical relays will be accepted.

Flasher to automatically cancel upon switching headlights to high beam.

3-18.6. WARNING LIGHTS - CAB ROOF:

A Whelen FN72QLED light bar with options; 3 additional FLDRR light-head sections, and two (2) front corner roto-beam sections, shall be mounted on the cab roof. Lens color shall be clear.

The lights shall be colored to comply with current NFPA standards in addition to all California regulations. Exact color shall be determined during the pre-construction meeting.

A LED California steady red identification light shall be mounted near the driver's side of the light bar.

3-18.7. WARNING LIGHTS - CAB FACE:

A pair of red Whelen M6 series LED lights furnished with clear lenses and chrome trim shall be provided on the front of the cab above the headlights.

3-18.8. SIDE ZONE LOWER LIGHTING:

Red, Whelen M6 series LED lights furnished with clear lenses and chrome trim shall be located at the front cab, center, and rear on each side of the apparatus required to meet the lower level optical warning and optical power requirements of NFPA.

3-18.9. REAR ZONE LOWER LIGHTING:

Two (2) red Whelen M6 series LED lights furnished with clear lenses shall be located at the rear of the apparatus and will be required to meet the lower level optical warning and optical power requirements of NFPA. Lights shall be mounted within the same trim ring as the stop/turn/reverse lights.

LOWER ZONE WARNING LIGHTS SHALL NOT BE PLACED BELOW THE RUNNING BOARDS - NO EXCEPTIONS.

3-18.10. WARNING LIGHTS (Rear of Hosebed):

Two (2) Whelen M6RC warning lights shall be provided at the rear of the truck, located one (1) each side. The color of the lights will be red.

There will also be two (2) Whelen M6 series LED lights provided at the rear of the truck, located one (1) each side. These lights are required by NFPA and shall be activated in the blocking mode only. The color of lights will be amber.

A Whelen model TAL65 (or similar) traffic advisor with control module shall be mounted at the rear of the vehicle below the main hose bed. Traffic advisor shall be recess mounted or mounted below a step or similar feature to protect lights from mechanical damage. Control module shall be provided and installed within easy reach of the driver, or may be integrated with smart siren control head.

The rear warning lights shall be mounted on top of the compartmentation with all wiring totally enclosed. The rear deck lights shall be mounted on the beavertails high as possible.

3-18.11. MECHANICAL SIREN

One Federal Signal Q-Siren (Q2B-NN) shall be provided. Siren shall be top mounted on front bumper in such a manner that it will not extend beyond front edge of bumper. There shall be two (2) sets of siren/brake switches, each located on the dash board within easy reach of the driver's, and captain's positions.

1-19. **Pump Panel:**

3-19.1. GENERAL:

The pump control panel shall be the "side mount style" located to the rear of the driver's side cab, forward of the high left side compartmentation.

The pump panel shall not exceed 40" in width

The panel shall be equipped to control and/or monitor these engine functions; engine speed, coolant temperature, lubrication system pressure, charging system voltage.

The panel shall have provisions for and be equipped to; control and monitor all pump discharge flows except the master stream, control and monitor all pump to water tank connections, control excessive pump pressure, U.L. pump testing outlets, water intake into the pump, activate pump primer, control auxiliary emergency scene lighting, radio communications.

The pump and gauge panels shall be constructed of polished stainless steel.

Polished trim collars shall be installed around all inlets and outlets.

The pump pressure and vacuum gauges shall be installed adjacent to each other at the pump operator's control panel.

3-19.2. PUMP PANEL:

The panel shall be equipped with the following features with layout of such features to be determined at a preconstruction conference:

- 1 - Two piece panel featuring polished stainless steel finish, easily removable or accessible for maintenance service and/or repairs of panel components. The gauge and

control panels shall be two (2) separate panels for ease of maintenance. The side gauge panel shall be hinged with a full length stainless steel hinge. Shall be equipped with redundant LED illumination shielded from operators eyes.

- 1 -Fire Research TGA 400 installed in such a manner as to be protected from physical damage by crosslay hose couplings.
- 1 -U.L. pump r.p.m. counter test outlet w/cap.
- 1 -4-1/2" (minimum) pump master "suction" gauge (back lit, liquid silicone filled, able to read from 30 inches Hg. vacuum, zero, and up to graduated pressure readings more than 300 psi. but not greater than 400 psi.). A 1/4" NPTF U.L. test port w/plug mounted directly adjacent to the gauge.
- 1 -4-1/2" (minimum) pump master "Pressure" gauge (back lit, liquid silicone filled, able to read graduated pressure readings from zero to 600 psi. A 1/4" NPTF U.L. test port w/plug mounted directly adjacent to the gauge.
- 1 -FRC tank-vision water level indicator gauge. Model WLA200-A00 equipped with chrome bezel
- 1 -Pump relief valve pilot control w/indicator light(s).
- 13 -3" discharge pressure gauges (back lit, liquid silicone filled, able to read pressure 0 to 400 psi., and mounted directly adjacent to the corresponding control lever. Gauge shall be vibration resistant.
- 1 -Auxiliary cooling control
- 1 Pump primer control switch
- 1 control panel and inlet/flush for FoamPro refill system
- 4 -Switches for activation of scene lighting
- 1 - Switch for activating pump panel illumination.
- 1- Switch for activating air horn
- 1-switch for activating inverter
- Air compressor PTO engagement switch, (see 3-23.4)
- Auto Sync compressor controls
- Air compressor temperature gauge
- CAF System air pressure gauge
- Air flow meter.
- An air valve for each of the five (5) CAFS discharges.
- Auxiliary compressed air outlet and 1/4 turn valve
- FoamPro digital computer control display.
- FRC tank-vision foam level gauge model WLA260-A00 with chrome bezel.
- Hose reel rewind button
- Overheat protection manager display

3-19.3. CONTROL RODS:

All push/pull discharge controls shall have anodized aluminum or stainless steel rods. The control rods pull straight out of the panel. The remote push/pull control rods shall be equipped with universal joints to eliminate binding. Guides for the push/pull control rods shall be securely mounted to the pump panel.

All control rods shall be mounted directly adjacent to the corresponding gauge; equipped with provisions to positively lock using a ¼ turn locking mechanism in any range of the travel. Each rod handle shall be easily identified on the operator panel with a permanent label with contrasting letters to the label background.

3-19.4. COLOR CODED NAME TAGS:

All outlet discharges shall have color coded name tags, with each discharge having its own color. These tags shall be used for labeling the discharge pressure gauges, controls, outlets and drains.

3-19.5. LIGHT/ SHIELD:

Pump panel lights shall be installed under a polished stainless steel or anodized aluminum shield on both passenger and drivers side pump panels. Lights shall be LED type, and activated by a switch located on the drivers side pump panel.

1-20. Pump:

3-20.1. PUMP TYPE:

Pump shall be a 1500gpm rated, single stage centrifugal type. Pump shall be midship mounted and split-case driven.

The pump shall comply with all applicable requirements of the latest standards for automotive fire apparatus of the National Fire Protection Association, NFPA No. 1901.

The pump shall be selected from the one of the following 2 options:

1. Waterous CX series
2. Hale DSD series

3-20.2. PUMP BODY:

Pump body shall be vertically split in two sections for easy removal of the entire impeller shaft assembly, and designed for complete servicing from the bottom of the engine without disturbing setting of the pump in the chassis or apparatus piping which is connected to the pump.

3-20.3. DISCHARGE MANIFOLD:

Discharge manifold shall be fabricated entirely from stainless steel material. The manifold shall be designed and constructed to provide efficient water/foam flow to all specified discharges, and shall incorporate a CAFS Class A Foam Proportioning Manifold. Manifold shall be fabricated with provisions for specified anode system.

3-20.4. IMPELLER SHAFT:

Impellers shall be bronze, accurately balanced, and appropriately treated to resist wear and damage. Impeller shaft shall be stainless steel, and utilize oil-lubricated ball bearings. No sleeve type bearings shall be used.

3-20.5. MECHANICAL SEAL:

Pump shall be equipped with a mechanical dripless type seal. Seal shall be of a maintenance free design and require no adjustment

3-20.6. PUMP TRANSMISSION:

Pump transmission shall be selected to match pump as recommended by pump manufacturer, and shall be of the same manufacturer as the pump. The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

3-20.7. PUMP SHIFT:

Pump shift shall be pneumatically operated and shall use a standard automotive air valve to control a double action air shift cylinder so that the pump shift remains in its latest position in the event of loss of air pressure. The in-cab control valve shall include a detent lock to prevent accidental shifting.

A manual back-up shift control shall also be located on the driver's side pump panel.

Two (2) indicator lights shall be provided adjacent to the pump shift inside the cab. One (1) green light will be labeled "pump engaged" and indicate the pump shift has been completed. The second green light shall indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light will be labeled "ok to pump".

Another green indicator light shall be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This indicator light shall be labeled "Warning: Do not open throttle unless light is on".

3-20.8. PRIMING SYSTEM:

Priming system shall include an electrically driven rotary vane priming pump, rigidly attached to the pump transmission or other solid mounting point, and activated by a mechanical/electrical valve with a single control (push or pull). Valve actuation may be accomplished while the main pump is operational, if necessary to assure a complete prime. The priming system shall be oilless.

The complete primer unit will be fabricated by the manufacturer of the fire pump.

3-20.9. PUMP ANODE SYSTEM:

Pump shall be furnished with a Hale AnodePro protection system (or equivalent) including a minimum of two (2) Hale "intelligent anodes" mounted into flanges in the

pump manifold, one on each side of the pump in the main suction manifolds. The system shall be furnished with an AnodePro (or equivalent) display module mounted inside the engineers compartment.

3-20.10. PUMP OVERHEAT PROTECTION:

Pump shall be furnished with a pump overheat protection system. This system shall be furnished by the selected pump manufacturer. The discharge of the relief valve shall be plumbed back to booster tank. This system shall include pump panel mounted display with test button.

3-20.11. PRESSURE GOVERNOR:

- Fire Research INControl TGA400 (or model recommended by manufacturer for selected drive train) electronic pressure governor system shall be provided. TGA 400 control knob shall be programmed to raise pressure/rpm when turned COUNTER CLOCKWISE, and graphic shall show arrow in corresponding direction.

3-20.12. INTAKE RELIEF VALVE:

A pilot operated intake relief valve shall be provided by the pump manufacturer. The pilot valve shall be mounted in a position specified by the purchaser, and allow adjustment from 50 psi to 250 psi. A pilot operated intake relief valve will allow full opening of the relief valve with a very small intake pressure above set pressure.

3-20.13. DISCHARGE VALVES:

Discharge valves shall be of stainless steel construction. And shall comply with specifications in section 3-22.2.

3-20.14. PUMP SUCTION STRAINERS:

The suction fittings shall include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

3-20.15. MANIFOLD DRAIN VALVE ASSEMBLY:

The pump shall be equipped with a manifold drain valve assembly consisting of a stainless steel plunger in a bronze body with multiple ports. The valve shall be designed so that the pump discharge pressure prevents it from opening accidentally. The drain valve control shall be panel mounted, cable or rod operated and identified PUMP DRAIN.

3-20.16. AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system shall be provided to allow the use of water from the discharge side of the pump for cooling the engine water. The heat exchanger shall be cylindrical type constructed of all brass and will be a separate unit. The heat exchanger shall be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger will be plumbed to the master drain valve.

3-20.17. PUMP MOUNTING

Pump will be mounted to a substructure which will be mounted to the chassis frame rail using rubber isolators. The mounting will allow chassis frame rails to flex independently without damage to the fire pump.

3-20.18. PUMP COMPARTMENT

The pump compartment will be separate from the hose body and compartments so that each may flex independently of the other. It will be a fabricated assembly of steel or aluminum tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment shall be constructed to be accessible from three (3) sides to facilitate access for maintenance and/or repairs. The side pump compartment opening shall be a minimum dimension of 24" x 36", and shall not require any disassembly of the pump outlet connections.

The pump and associated plumbing shall be accessible from the front when at apparatus cab is raised. If the front of the pump compartment is enclosed by metal paneling, this paneling shall be removable without the use of tools. This may be accomplished with latches, ¼ turn fasteners etc.

3-20.19. PUMP WARRANTY:

The manufacturer shall provide a two year warranty (minimum) for the pump.

3-20.20. PUMP INSTALLATION CERTIFICATION:

The fire apparatus manufacturer shall provide at the time of the pre-construction meeting a letter from the pump manufacturer stating they approve of the pump installation.

1-21. **Water Tank:**

3-21.1. WATER TANK:

Booster tank shall have a capacity of 750 gallons (minimum) and be constructed of polypropylene plastic.

Tank shall be T-shaped to provide for deep side compartments and to serve as a large sump to limit the amount of undraftable water.

Tank joints and seams shall be nitrogen welded inside and outside.

Tank shall be baffled in accordance with NFPA Bulletin 1901 requirements.

Baffles shall have vent openings at both the top and bottom to permit movement of air and water between compartments.

Longitudinal partitions shall be constructed of .38" polypropylene plastic and will extend from the bottom of the tank through the top cover to allow for positive welding.

Transverse partitions will extend from 4.00" off the bottom of the tank to the underside of the top cover.

All partitions shall interlock and shall be welded to the tank bottom and sides.

Tank top shall be constructed of .50" polypropylene. It will be recessed and shall be welded to the tank sides and the longitudinal partitions.

Tank top shall be sufficiently supported to keep it rigid during rapid filling conditions.

Construction shall include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels on each side shall be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

Two (2) sumps approximately 8.00" long x 8.00" wide x 6.00" deep shall be provided at the bottom of the water tank. One (1) forward, one (1) rear.

Sumps shall include a 1" drain plug and the tank outlet.

Tank shall be installed in a fabricated steel cradle assembly constructed to support the weight of the filled tank. Sufficient cross members shall be provided to properly support bottom of tank.

Tank shall "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, capable of supporting the weight of the filled tank shall be placed on all horizontal surfaces on which the tank rests.

Stops or other provision shall be provided to prevent an empty tank from bouncing excessively while moving vehicle.

Mounting system shall be approved by the tank manufacturer. Fill tower shall be constructed of .50" polypropylene and shall be a minimum of 8.00" wide x 14.00" long.

Fill tower shall be furnished with a .25" thick polypropylene screen and a hinged cover. Fill tower shall be accessible without raising the hose bed cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, shall be installed approximately halfway down the fill tower and extend through the water tank and dump to the rear of the rear axle. Two (2) sleeves shall be provided in the water tank for plumbing to the rear.

The water tank shall incorporate a 20 gallon foam tank as detailed in 3-23.7 below.

Tank shall have 2 zinc anodes installed from the bottom of the tank. Anodes shall extend upward to within 1" of the top of the tank. Anodes shall be located such that they can be replaced without disassembling any other components of the apparatus.

3-21.2. WATER TANK WARRANTY:

Tank shall have a minimum 20 year warranty.

1-22. **Plumbing:**

3-22.1. GENERAL:

All pipe plumbing shall be routed to minimize friction loss and flow turbulence to components. All plumbing shall be routed in a manner not to require disassembly to access major pump components.

All water plumbing greater than 2" in diameter shall be constructed entirely of stainless steel, with only the below noted exceptions. Where vibration or chassis flexing may damage or loosen piping, or where a coupling is required for servicing, the piping will be equipped with victaulic or similar rubber couplings.

Exceptions to Stainless steel plumbing requirement:

- 1) Tank-to-pump plumbing may be constructed of appropriate synthetic material.

All plumbing 2" and smaller, used on the discharge side of the pump, shall utilize rubber hose reinforced with hi-tensile polyester or stainless steel braid, with at least one (1) swivel fitting, facilitating easy replacement.

All plumbing used for foam concentrate will be stainless steel, brass, or synthetic hose with stainless steel or brass fittings. The plumbing installed for foam solution will be of a material suitable for use with a foam system to prevent flaking or corrosion of the pipe.

All lines shall be equipped with individual 1/4 turn drain valves and their respective discharges extended with a hose to drain below the chassis frame.

All water carrying gauge lines shall be of flexible polypropylene tubing.

Consideration shall be given to allow adequate swing clearances to connect and disconnect all suction and discharge lines using spanners.

NSHT denotes National Standard Hose Thread.

3-22.2. VALVES:

Waterous valves shall be used for the side 2.50" discharges, and the 3.50" tank to pump. All remaining ball valves, 3.00" or less, shall be Waterous or Hale or equivalent in-line type valves with stainless steel valve balls.

Valves shall be all stainless steel (both body and balls made from stainless steel), inline, ball type, with self-adjusting seal for water. All discharge /suction valves shall operate freely up to maximum pump discharge pressure. Valve seal shall be between the pump and the valve stem mechanism to minimize air leaks and facilitate draining. Means shall be provided for attaching (1) a pressure gauge which will indicate the pressure in the line immediately outboard of the valve, and (2) a drain of at least 3/4 inch NPT for simultaneously draining the valve and line outboard the valve.

3-22.3. DISCHARGE OUTLET CONTROLS:

The discharge outlets 2-1/2" and under shall incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism shall be "push - pull" and shall be open in the out position. All valves shall have a 1/4 turn lock. Valves shall be timed and properly phased to fully open and close with the control lever range of travel. Provisions shall be made for adjustment of the control lever to ball valve linkage.

Discharges of 3" and greater shall have a slow-acting valve in accordance with NFPA 1901.

Discharges shall be labeled with identical color and style labels used for each associated control valve.

3-22.4. PUMP INLETS - GENERAL:

All pump inlet connections shall be designed and constructed to minimize water flow restrictions. The apparatus builder shall utilize "victaulic couplings" where inlet plumbing is to be susceptible to excessive frame torsional movement, tank torsional movement, and/or facilitate component removal, in lieu of cutting.

3-22.5. TANK TO PUMP:

The booster tank shall be connected to the intake side of the pump with piping sized to deliver a minimum of 500 GPM of water to the pump (per Section **Error! Reference source not found.** of this specification) from either the front or rear sump. Piping from the front sump shall be run to the 3.5" Waterous tank valve on the pump. Piping from the rear sump shall be run to a 3.00" Waterous auxiliary suction valve on the pump. Front and rear tank to pump valves shall have the controls remotely located at the operator's panel and shall be clearly labeled "FRONT TANK SUCTION" and "REAR TANK SUCTION". Rubber or Victaulic couplings will be included in these lines to prevent damage from vibration or chassis flexing.

A check valve will be provided in the tank to pump supply lines to prevent the possibility of "back filling" the water tank.

3-22.6. MAIN INLETS:

A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens, and chrome caps.

Main pump panel shall be configured to provide adequate clearances for a TFT jumbo low profile series 6" ball intake valve with pressure relief model# AXD1ST-NX-T or AXD1ST-NX-F to be installed by the Purchaser after apparatus delivery.

The right side suction shall be 6.00" NSHT to 5.00" Storz with a 30 degree elbow and a 5.00" blind cap with chain.

3-22.7. SHORT SUCTION TUBE:

The suction tubes on the pump will have "short" suction tubes to allow for installation of adapters without excessive overhang.

3-22.8. INLET (Sides):

On each side of the pump panel, above the running board, forward of the main suction inlet shall be one (1) 2.5" auxiliary suction terminating in 2.50" NSHT female and shall be equipped with a strainer, chrome swivel and plug with chain.

The inlet shall be equipped with an in-line 2.5" 1/4 turn ball valve behind the side panel. Each inlet valve shall be controlled at its respective side pump panel.

3-22.9. INLET (Rear):

At the rear of the apparatus, above the bumper, on the Right side of the vehicle, shall be one (1) 2.5" auxiliary suction terminating in 2.50" NSHT female and shall be equipped with a strainer, chrome swivel and plug with chain.

Inlet shall be equipped with a 1/4 turn 2.5" valve controlled at the operator pump panel.

3-22.10. INLET BLEEDERS:

A bleeder valve shall be provided for each side gated inlet. The valves shall be located behind the panel with a pull type knob for the control extended to the outside of the panel. The water, that is discharged by the valve, shall be routed below the chassis frame rails.

3-22.11. MAIN OUTLETS:

(Five (5) - 2.5" Outlets, One (1) - 3.0" Outlet) and one deluge riser.
The location of the pump discharge outlets shall be as follows:

3-22.12. DISCHARGE OUTLETS (Left Side):

There shall be two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with a male 2.50" NSHT, mounted above the 6" main pump inlet, horizontally stacked.

3-22.13. DISCHARGE OUTLET (Right side):

There shall be one (1) discharge outlet with a 2.50" valve on the right side of the apparatus, terminating with a male 2.50" NSHT, mounted above the 6" main pump inlet.

3-22.14. HIGH GALLONAGE OUTLET (Right side):

The apparatus shall have one (1) of the main pump outlets equipped with provisions for flows into LDH. There shall be one (1) discharge outlet with a 3.00" valve on the right side of the apparatus, terminating with a male 3.00" NSHT to 45 degree elbow to 5" Storz adapter with 5" Storz blind cap.

The location of the valve shall be to the rear of the 2.50" discharge valve in a horizontal stack.

3-22.15. DISCHARGE OUTLET (Rear right side):

There shall be one (1) discharge outlet located above the rear compartment, below the main hose bed floor, with allowances for the adequate swing clearance to connect a 2.50" pre-connected line.

Plumbing shall consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel. Valve shall be labeled, "RIGHT REAR DISCHARGE"

3-22.16. DISCHARGE OUTLET (Rear left side):

There shall be one (1) discharge outlet located above the rear compartment, below the main hose bed floor, with allowance for the adequate clearance to connect a Task Force Tips model WT5NJ-NJ-NF water thief, and hoses to its discharges. The Task Force Tips model WT5NJ-NJ-NF water thief shall be included with the apparatus.

Valve shall be labeled "LEFT REAR CAFS DISCHARGE"

Plumbing shall consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel.

3-22.17. TRANSVERSE OUTLETS:

There shall be two (2) 2.00" discharge outlets piped to the front two crosslay hosebeds. Outlets to be equipped with an 1.50" NSHT 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus and have provisions to pivot unencumbered by the hose bed flooring. Plumbing will consist of 2.00" piping along with a 2.00" quarter turn, full flow ball valve with control from the pump operators panel.

There shall be one (1) 3.00" discharge outlet piped to the rear crosslay hosebed. Outlet to be equipped with an 2.5" NSHT 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus and have provisions to pivot unencumbered by the hose bed flooring. Plumbing will consist of 3.00" piping along with a 3.00" quarter turn, full flow ball valve with control from the pump operator's panel.

Valves shall be labeled "FRONT CAFS CROSSLAY", "CENTER CAFS CROSSLAY" and "BLITZ CAFS CROSSLAY".

3-22.18. DISCHARGE OUTLET (Front Bumper):

There shall be one (1) 1.50" discharge outlet featuring a chrome plated 90-degree swivel, piped to the top of one side of the front bumper extension. Plumbing will consist of 2.00" piping and flexible hose according to the design requirements of the chassis. A 2.00" full flow ball valve controlled at the pump operator's panel shall be used in the outlet plumbing. Automatic drains will be provided at all low points of piping. Valve shall be labeled "BUMPER LINE CAFS".

3-22.19. REEL LINE

There shall be one (1) reel line, sized to hold 100' of 1" REEL-TEX line (or equivalent), with a TFT combination nozzle with pistol grip and bail. Reel shall be Hannay brand, shall be constructed of aluminum or stainless steel, shall not be painted, and shall be mounted in a manner such that it is protected from accumulating debris and water. The reel shall be equipped with an electric rewind feature, and the rewind switch shall be located in a position facilitating easy rewinding by a single person. Manual rewind handle shall be provided. Plumbing to reel shall be 1-1/2", and there shall be a 1-1/2" full flow ball valve controlled at the pump panel. Hose connection on reel shall be 1" NH.

3-22.20. DELUGE RISER WITH BYPASS:

A 3.00" deluge riser shall be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping shall be installed securely so no movement develops when the line is charged. The riser shall be gated and controlled at the pump operator's panel.

This outlet shall have two (2) supply lines teed together to allow proper water flow in the water only operation and the water/foam operation. The water only piping will consist of a 3.00" ball valve and a check valve to prevent foam from contaminating the water pump. The water / foam piping shall include a 2.5" ball valve plumbed into the foam system and will include a stainless steel static mixer.

3-22.21. MONITOR:

A Task Force Tips "Crossfire" monitor rated to 1250 GPM shall be properly installed on the deluge riser. Monitor shall be furnished with a shaper tube, stacked tips, and a combination nozzle. Monitor shall be installed in such a manner that when in the stowed position, no portion of the monitor will extend above the top of the crew cab or

hosebed. This monitor shall be provided with SAFE-TAK portable base with one (1) 5.00" Storz inlet. The portable base shall be stored securely mounted in a bracket.

3-22.22. TELESCOPIC PIPING - MONITOR:

The deluge riser piping shall include a 18" Task Force Extend-A-Gun extension. This extension shall be telescopic to allow the deluge gun to be raised 18" increasing the range of operation. A position sensor shall be provided on the telescopic piping that will activate the "do not move vehicle" light inside the cab when the monitor is in the raised position.

The deluge riser will have a 3.00" four-bolt flange for mounting the monitor.

With the Extend-a-Gun and, Task Force "Cross Fire", in the stored position the height will not exceed the highest point on the cab.

3-22.23. DISCHARGE CAPS:

Chrome plated, rocker lug, caps with chains shall be furnished for all discharge outlets up to 2.5". The 3.00" right side discharge shall be furnished with a 5" Storz blind cap.

3-22.24. OUTLET BLEEDER:

A .75" bleeder valve control shall be provided for each outlet 2.00" or larger. The bleeder shall be recessed behind the panel with the control extending through the panel and shall be located in a horizontal line along the bottom of the side pump panels. The bleeder controls will be properly labeled, identifying them to each outlet they are connected to. The water discharged from the bleeder will be routed below the chassis frame rails.

3-22.25. ELBOWS, LEFT SIDE OUTLETS:

The 2.50" discharge outlets, located on the left side pump panel, shall be furnished with a 2.50"(F) NSHT x 2.50"(M) NSHT, chrome plated, 45 degree elbow. Valve assemblies which include a built in downturn angle shall be considered to comply with this specification without additional elbows.

3-22.26. ELBOWS, RIGHT SIDE OUTLETS:

The 2.50" discharge outlet, located on the right side pump panel, shall be furnished with a 2.50"(F) NSHT x 2.50"(M) NSHT, chrome plated, 45 degree elbow, and 3.00"(F) NSHT x 2.50"(M) NSHT, chrome plated, 45 degree elbow respectively. Valve assemblies which include a built in downturn angle shall be considered to comply with this specification without additional elbows.

3-22.27. BACKPUMP FILL OUTLET

An accessory outlet shall be provided for filling backpumps and other utility use. This outlet shall be gravity-flow from the booster tank. Outlet shall be 3/4" clear vinyl tubing or similar and located below the pump panel. Tank fitting for this outlet shall be

plumbed a minimum of 3" above the bottom of the tank sump to prevent small debris in tank water from becoming drawn into or clogging this discharge.

1-23. **CAFS Foam System:**

3-23.1. **GENERAL:**

A 200 CFM (minimum) Compressed Air Foam System (CAFS) shall be designed to provide compressed air foam to six (6) discharges. It shall be capable of providing foam solution or compressed air foam from any of the specified CAFS discharges simultaneously. In addition, the consistency of the compressed air foam (wet to dry) from each discharge shall be adjustable.

The air compressor shall be driven by a dedicated transmission PTO. The air compressor may not be driven through a clutch on the main fire pump drive, NO EXCEPTIONS.

3-23.2. **COMPRESSOR SYSTEM:**

The air compressor will be oil flooded rotary screw type, sized to provide a maximum of 200 CFM in the installed configuration. The air compressor drive system shall be designed to operate the air end at maximum RPM when the water pump is developing 130 to 140 PSI in a "no flow" state. The completed compressor unit shall be capable of maintaining prolonged pressures from 100 to 175 pounds per square inch throughout the service life of the CAF System.

The compressor shall be controlled by a pneumatic modulating inlet valve mounted on the air end inlet. This controller shall sense air pressure and control the air delivery of the air end while maintaining constant pressure. An auto-sync balancing system shall be provided to maintain the air pressure within plus or minus 2% of the water pressure, throughout the CAFS pressure range. Auto-sync controls shall be installed on the pump operator's panel, with the following modes:

- 1) **Automatic:** Air pressure matched to the water pressure.
- 2) **Fixed:** Air pressure defaults to manual setting on compressor mounted control valve.
- 3) **Unloaded:** Air pressure reduced to 40 PSI for standby operations with the compressor engaged.

All oil and control air shall be routed in wire braided hose conforming to SAE 100R1 standards for hydraulic hose. The compressor system sump/pressure vessel shall be constructed entirely of stainless steel. The sump shall have an oil level sight glass and threaded brass fill cap.

The air compressor system shall feature a spin-on, full-flow oil filter unit and thermostatic valve to control oil flow to the cooler. This thermostat shall maintain the system oil temperature within the designed limits.

A modular air/oil separator unit with a spin-on element shall be provided and installed in close proximity to the sump. Replacement elements for the oil filter and separator shall be readily available.

The compressor shall be cooled by the apparatus fire pump, utilizing an all copper and brass shell and tube heat exchanger. Water shall flow through the heat exchanger whenever the fire pump is operating. An in-line stainless steel basket strainer shall be installed on the water inlet side of the heat exchanger to prevent clogging. The strainer shall be accessible for cleaning. The compressor cooling system shall be capable of maintaining recommended operating temperatures throughout its full operating range at ambient temperatures up to 115 degrees Fahrenheit. A fail-safe switch shall be provided to preclude engagement of the compressor PTO unless the fire pump is engaged.

3-23.3. PLUMBING:

A foam manifold with integral FoamPro paddlewheel flow sensor shall be installed to distribute foam solution to the foam discharges. A check valve is provided at the inlet end of the manifold to prevent foam solution back-flow. All added foam piping shall be stainless steel or high-pressure wire braid reinforced hose with stainless steel fittings.

All compressed air foam discharges shall be equipped with check valves on both the water and air plumbing to prevent back-flow of foam solution and / or CAF into the pump or air lines.

Compressed air foam shall be plumbed separately from the water discharge to the deck gun so as not to effect the water flow capacity of the appliance. Separate water and air valves for foam production shall be located immediately under the deck gun. A static mixer, of all stainless steel construction shall be incorporated into the plumbing of the master stream discharge to provide optimal foam production.

3-23.4. CONTROLS AND INSTRUMENTS:

The following CAFS system controls and instruments shall be provided on the pump operators panel, arranged in a logical and user friendly manner:

- Air compressor PTO engagement switch.
- Auto Sync compressor controls (Auto/Manual, Run/Unload) with engraved instruction plate
- Air compressor temperature gauge with warning light and audible alarm
- Air pressure gauge
- Air flow meter (CFM)
- An air valve for each compressed air foam discharge; handles to be adjacent to and color coded with water valves

- FoamPro 2001 control head
- Auxiliary compressed air outlet and 1/4 turn valve

3-23.5. FOAM PROPORTIONER:

An automatic flow based proportioning system shall be installed to measure water flow and automatically adjust itself to deliver a consistent foam concentrate ratio based on the flow to the foam manifold. Foam concentrate is injected and mixed on the discharge side of the water pump through a single injection point on the inlet side of the foam manifold.

Foam concentrate is pumped from the foam tank and injected into the waterline and mixed into a manifold. Precise foam concentrate rates from .1% to 3% are adjusted with a digital totalizer display/control which also displays the current GPM and total gallons flowed. A low concentrate warning and a no concentrate warning with an automatic concentrate pump shutoff shall be provided.

The system shall be controlled from the pump operator's panel. The system shall be engaged with an on/off push button type switch. Proportioning shall be controlled by the digital totalizer display/control.

The proportioner shall be installed according to manufacturer's specifications.

This system shall be capable of handling Class "A" foam concentrates.

ALL CAFS COMPONENTS SHALL BE READILY ACCESSIBLE FOR MAINTENANCE AND / OR REPLACEMENT.

3-23.6. FOAM OUTLETS:

The foam system will be plumbed to six (6) discharges. The discharges will be front bumper outlet (1.75"), two (2) crosslay outlets (1.75"), one (1) Blitz line crosslay (2.5"), the left rear discharge (2.50"), and the deluge monitor. All CAFS discharges shall be taken off the CAFS manifold.

3-23.7. FOAM TANK:

The foam tank will be an integral portion of the polypropylene water tank. The foam cell will have a minimum capacity of 30 gallons of foam. The foam cell will not reduce the capacity of the water tank. The foam cell will have a drain valve located inside the pump compartment accessible through a door on the passenger's side pump panel. The foam cell shall have a fill tower, no less than 6" in diameter with a screen in the fill dome and a breather in the lid.

3-23.8. ALTERNATE FOAM TANK:

The 30 gallon foam tank may be remotely located

3-23.9. FOAM FILL SYSTEM

. A Truck mounted refill system shall be installed. Control and foam inlet shall be located on the pump panel. Inlet shall be located such that drips of foam concentrate shall not land on any control, step or other appurtenance.

3-23.10. AUXILIARY AIR OUTLET

One auxiliary $\frac{3}{4}$ " air-only outlet shall be provided for use with air powered tools and accessories. Outlet shall appear on pump panel as a stainless steel $\frac{3}{4}$ " "Chicago style" pneumatic fitting with stainless steel blind cap. Line shall be plumbed into CAFS AIR ONLY using $\frac{3}{4}$ " (minimum) plumbing, and shall be equipped with a $\frac{1}{4}$ turn full-port valve located on the pump panel. Valve and handle shall be of the same style as other valves on apparatus. Outlet shall be labeled: "HI-FLOW AIR OUTLET"

3-23.11. FOAM SYSTEM TRAINING:

Foam system operation and maintenance training will be provided by a authorized factory representative. The training shall be conducted at a time and location determined after delivery, but prior to placing the unit in-service.

1-24. **Body Mounting:**

3-24.1. UNDERBODY SUPPORT SYSTEM:

Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load shall be provided.

The backbone of the support system shall be the chassis frame rails. A steel support system shall be bolted to the frame.

A steel frame shall be mounted on the top of the these supports to create a floating substructure. which will result in a 500 pound equipment support rating per lower compartment. The floating substructure shall be separated from the horizontal members with neoprene elastomer isolators. The compartment body shall be supported by this steel substructure.

Diagrams of the proposed body mounting assembly shall be included with the bid.

A design with body compartments hanging on the chassis in an unsupported fashion shall not be acceptable.

1-25. **Main Hose Bed:**

The main hose body consisting of side panels, flooring and partitions, shall be designed to adequately store and protect the amount of hose in the general requirements.

The side panels and partitions shall be constructed of aluminum or stainless steel. The material shall be of a gauge sufficiently strong so as not to require any additional support brackets that will cause couplings to hang up during hose removal.

Provide three (3) full length, adjustable partitions. Center partition shall be a backboard compartment. (section 3.24.02) The 2 Outer hose bed dividers (not center backboard storage/divider) shall have and grab holes cut into them. These holes shall appropriately be sized for gripping with a gloved hand, and free from sharp edges or burrs.

The main hose bed shall be equipped with a removable hose ventilating rack.

Main Hosebed shall accommodate:

- 250' x 2.5" DJ hose with TFT flip-tip nozzle
- 800' x 5.00" with Storz couplings
- 1000' x 3" DJ hose.
- 400' 1-3/4" double jacket hose in a single-wide stack.

1-26. Crosslay Hose Beds:

The Crosslay hose body shall meet the same requirements applicable to the main hose body, two (2) adjustable partitions are required.

The transverse hose body shall be designed to accommodate two (2) 200' lengths of 1.75" hoses with pistol grip Task Force Flip-Tip nozzles, and one (1) 200' length of 2-1/2" hose with pistol grip Task Force nozzle. Each of the first two beds must have a minimum width of seven (7) inches throughout body, and at exits. The third bed must have a minimum width of 9.25 inches throughout body and at exits.

The transverse hose bed shall be equipped with stainless steel rollers at the bottom and guide assemblies at each side of the apparatus directly adjacent where the hose exits the bed, not to interfere with the raising or lowering of the hose bed cover.

The transverse hose bed(s) shall be equipped with removable hose ventilating rack(s).

Crosslays shall not impede operation of the pump panel and shall be designed for ease of loading hose.

Crosslay hose bed shall be equipped with NFPA compliant side-covers, constructed of Black Vinyl (or similar) material. These covers shall be secured in the closed position with aircraft seat belt type buckles and adjustable webbing straps. 2 spare covers shall be provided.

1-27. Hose Bed Covers - General:

The hose bed covers shall be designed for maximum durability and minimize exposure of hose to the weather elements.

The covers shall be constructed of .1875" aluminum tread plate (minimum) full length and widths of the hose beds and be of adequate construction to support a 250 lb. person without sustaining damage.

The covers shall be bolted to the body with (1) continuous piece stainless steel piano hinge, (3/16" pins minimum) and the cover edges, mounting bolts and hardware not to subject the hose to damage upon removal of the hose.

1-28. Main Hose Bed Cover:

3-28.1. GENERAL:

The main hose bed cover shall be designed as a two (2) piece cover, hinged on each side of the apparatus hose bed. Left side shall overlap the right side.

The apparatus builder shall provide means to access fill tower without raising the hose bed cover.

The covers shall have provisions to securely lock in an upright position, a manner which will not allow the covers to dislodge from the locked position unless manually released.

The main hose bed covers shall have appropriate strength gas-charged spring struts to assist opening of the covers. The gas spring struts shall be of a standard commercially available type.

Provide one (1) device to secure and release the cover from closed position, at the rear of the apparatus only. Control shall not interfere with hose removal.

Stainless steel or chrome plated metal grab handles shall be provided to assist in opening and closing the cover.

A black vinyl flap will be installed on the rear of the bright aluminum treadplate hosebed cover. (One spare flap shall be provided). Bottom of flaps shall be secured with aircraft seat belt type buckles and adjustable webbing straps. There shall be white lettering of a similar material to the flaps affixed to the flaps reading "E57". Lettering shall be as large as reasonably possible.

LED Lights shall be provided on the underside of the hosebed covers to illuminate the hose bed. The lights shall be protected from damage, and shall not interfere with removal of hose from bed.

3-28.2. BACKBOARD COMPARTMENT:

One backboard compartment shall be fabricated of flat aluminum and shall serve as the Center hose bed divider. The compartment shall be a minimum of 18" high and 4" wide and shall have a hinged, latching cover at the rear.

1-29. Crosslay Cover:

A hinged aluminum treadplate cover shall be installed over the crosslay hosebeds. It will include a chrome grab handle at each end for opening and closing the cover and a foam rubber or silicone gasket where the cover comes into contact to a painted surface. The cover shall be operable without raising the main hose bed covers.

1-30. Compartment Body Construction:

3-30.1. EQUIPMENT COMPARTMENTS - GENERAL:

All compartments and compartment doors shall be designed for maximum durability to withstand a high frequency of use throughout the life of the apparatus.

All compartments shall be of modular construction, constructed to allow replacement of individual components if worn or damaged.

All compartments shall be designed and constructed of materials necessary not to require additional internal reinforcing sub frames or support brackets.

All compartment assemblies shall include the following common characteristics:

Totally weather sealed, with weather stripping to be closed cell neoprene or automotive equivalent and to not be of the glue on type.

Provisions for adjustable shelving. Compartments requiring adjustable shelving shall be specified, individually.

Compartment interior shall be coated with Zolatone or equivalent scratch-resistant coating, with background color to be medium to light gray.

Body and compartments shall be fabricated of aluminum or stainless steel.

All seams in the compartments shall be sealed with continuous permanent silicone caulking.

Side compartments shall be an integral assembly with the rear fenders.

Circular, bolted on, fender liners shall be provided for prevention of rust pockets and ease of maintenance.

Compartment flooring shall be of the sweep out design with the floor higher than the compartment door lip.

All compartments shall have floor inserts (to be approved by purchaser) to allow for air circulation.

Compartment door framing detail shall be provided.

Drip protection shall be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel.

The top of the compartment shall be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward sides. These covers will have the corners welded and polished.

Front and rear facing compartment walls shall be covered with bright aluminum treadplate.

Only stainless steel bolts, nuts, and nutserts shall be used. Self tapping metal screws are not to be used in construction. All screws and bolts which protrude into a compartment shall have acorn nuts on the ends to prevent injury.

All electrical junctions or wiring within compartments shall be protected from mechanical damage resulting from equipment stored in the compartment. All terminal strips shall have protective covers.

All compartment doors shall be Amdor brand roll-up doors, excluding the rear compartment door. (see section 3-30.2)

All body compartments shall have a minimum of one (1) set of louvers stamped into a wall to provide air flow inside the compartment.

3-30.2. DOORS(s) SIDE AND REAR COMPARTMENT:

All roll-up door(s) shall be of brushed anodized, double faced, aluminum construction and manufactured by AMDOR or equivalent. The doors shall be painted to match apparatus body color. A lift bar shall be provided for each roll-up door. Lift bar shall be located at the bottom of door and have latches on the outer extrusion of the door frame. The doors shall be lockable with locking device being provided by same manufacturer as the doors and intended for such purpose. All roll-up door locks shall be keyed alike.

Pan doors shall be double-pan flush design. Doors shall be constructed of .125" thickness aluminum (minimum) inner wall and .109" thickness aluminum (minimum) outer wall. No self-tapping screws shall be permissible in the construction of the doors. There shall be a heavy-duty automotive type rubber molding installed on the overlap area of the doors to insure a weatherproof seal and to prevent water from collecting in the door sills. Doors shall be hung on continuous polished stainless steel hinge with a minimum pin size of 1/4". Doors shall be fastened to hinge with stainless steel bolts and nuts. Pan Doors shall be furnished with paddle type latches Tri-Mark 030-1300 D-

Paddle Handles, bright chrome finish with Chrome trim, (or similar) and shall be lockable.

All doors shall utilize a magnetic switch for control of "open compartment door" and "do not move apparatus" warning circuits and the compartment lights.

1-31. Compartment Body Configuration:

3-31.1. EQUIPMENT COMPARTMENTS - GENERAL:

All compartments shall be as deep as possible without infringing on pump module space but shall be a minimum of eighteen inches deep (18"). The depth of the compartments shall be calculated with the doors closed.

Compartment measurements shall reference compartment door opening size. The completed compartment dimensions shall be a minimum of the door size plus door mounting structure and compartment wall dimensions.

Except where otherwise specified, all compartments shall have back walls constructed of (or covered by) Performance Advantage Company "Pac-Track" tool mounting board. Sub-model of Pac-Track to be determined at pre-construction meeting.

All compartment door dimensions may be subject to change upon approval of purchaser.

Any compartments required or proposed by the bidder in addition to those specified shall meet specified construction standards and shall be identified in the bid proposal.

A complete drawing featuring compartment layout and dimensions shall be submitted with the bid proposal.

3-31.2. COMPARTMENTATION, DRIVER'S SIDE:

Two full-height compartments shall be located one ahead of (to be annotated as "L1") and one to the rear of the rear wheels (to be annotated as "L3").

The front driver's-side compartment shall be designated as the engineer's compartment. This compartment shall feature a tool box design in the lower half consisting of five (5) drawers for the purpose of containing various hose adapters, reducers, and tools. The dimensions of the drawers will be determined at the pre-construction meeting. This compartment shall have a rear wall of plain construction, not of "Pac-Track".

One horizontal compartment shall be located over the rear wheels (to be annotated as "L2"). In addition to having a rear surface covered with "Pac-Track" tool board, This compartment shall feature a Performance Advantage Company "Pac-Track" swing-out

tool mounting board. Swing out board shall be mounted in center of compartment, and shall be sized to fill entire compartment area.

3-31.3. COMPARTMENTATION, PASSENGER'S SIDE:

One horizontal compartment shall be located over the rear wheels (to be annotated as "R2").

Two full-height compartments shall be located one ahead of (to be annotated as "R1") and one to the rear of the rear wheels (to be annotated as "R3").

3-31.4. COMPARTMENTATION REAR:

Rear compartment door shall be double-pan, double-hung.

Rear compartment shall **NOT** be open into the rear side compartments.

Rear wall of Compartment shall be of ordinary construction and not "Pac-Track"

Closing of the door shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand.

Doors shall be adequately protected against colliding with any other portion of the apparatus.

3-31.5. SURFACES - GENERAL:

All ALDP shall be isolated from dissimilar metals.

Provisions shall be made to protect the apparatus finish at all entry/exit points and kick plate areas of the apparatus.

3-31.6. INTERMEDIATE STEPS / STEP PLATES:

All intermediate steps, when necessary and needed for cab entry or walkways, shall be designed in compliance with NFPA 1901.

3-31.7. STEP PLATES:

All step plates, when necessary and needed for high side access, shall be of the chrome folding style (make/model AKRON STYLE 375 or equivalent). No step plate shall have a diamond plate step surface.

3-31.8. ALUMINUM DIAMOND PLATED SURFACES:

The following surfaces shall be covered with ALDP, to facilitate ease of maintenance:

Forward facing panel, below pump operator panel.

Jump seat kick plate area.

Rearward facing of apparatus, from tailboard to hose body, between apparatus beavertail panels, excepting the NFPA required 50% "warning Chevron" coated area.

3-31.9. RUNNING BOARDS:

All body running boards shall be constructed of a minimum of 3/16" polished aluminum diamond plate. All outer edges shall have a double break edge dimension approximate to two (2) inches down with a one (1) inch return or similar strength configuration and shall conform to body contour not to exceed the overall body width. Running boards shall be supported from the frame. All components of the running boards shall be removable.

3-31.10. LEFT SIDE RUNNING BOARDS:

Shall have a minimum toe depth of 12 inches and have a maximum step height of 24 inches. Provide adequate indirect illumination of the running board.

3-31.11. PASSENGER SIDE RUNNING BOARD:

A hose trough sized to hold forty (40) feet of 5" LDRJ hose with Storz fittings on each end, shall be installed in the right (passenger) side running board. This hose tray shall be equipped with drain holes and grating and have a maximum step height of 24 inches. Provide adequate indirect illumination of the running board for night operation.

3-31.12. PULL-OUT HOSE LOADING PLATFORMS

Two (2) pull out work platforms shall be provided, located below pump panel on each side of the body. The platforms shall be for the purpose of more easily loading the crosslay hose beds. They shall stow flush with the running boards, and shall be positive locking in both stowed and extended positions. Locking device shall be easily operable with a single gloved hand. When extended, the platforms shall be a minimum of 18" deep and shall be as close to the same width as the pump panel as possible. Construction of the steps shall be of SlipNOT aluminum grating or similar non-slip open grating material allowing for water, dirt and debris to fall through the platform.

3-31.13. MOUNTED ACCESSORIES

The following accessories shall be supplied and mounted as directed by the Purchaser:

- Tool set with mounting brackets featuring 1 set rocker lug spanners, 1 set storz spanners, 1 hydrant wrench. To be mounted rear of apparatus.
- Tool set with mounting brackets featuring 1 set rocker lug spanners, 1 set storz spanners. To be mounted in pump panel area of apparatus.

3-31.14. TAILBOARD:

Rear step will also be constructed of .1875" bright aluminum treadplate.

Shall have a toe depth of a minimum 10 inches to a maximum 16 inches depth, and having a maximum step height of 24 inches. Provide adequate indirect illumination of the running board.

There shall be two (2) tow eyes at the rear of the apparatus, located near the end of the frame rails. The tow eyes shall have milled smooth edges and be triple chrome plated. Tow eyes shall be designed and positioned to allow a 20,000 pound straight horizontal pull in line with the centerline of the vehicle.

3-31.15. ACCESS STEPS

NFPA compliant folding steps shall be provided for access to top of apparatus. Steps shall be located at the rear of the apparatus.

3-31.16. LADDERS:

The following Duo-Safety ladders shall be furnished and meet or exceed latest NFPA standards.

- 35' foot, two (2)-section, series 900-A
- 24' foot, two (2)-section, series 900-A
- 14' roof, series 775-A
- 10' foot series 585-A Duo-Safety folding ladder

3-31.17. LADDER STORAGE:

It is the Department's intent to provide ladder storage in such a manner as to not increase the overall height of the vehicle. Venders may list one or more options for ladder storage and provide pricing information and sketches with their submittal.

3-31.18. ALTERNATIVE LADDER STORAGE METHODS:

Alternative methods include, but are not limited to, electric/hydraulic ladder rack, tunnel storage below the hose bed floor or a method or design to be named by the vendor. An electric/hydraulic ladder rack will be considered only if the ladders may be removed from the rear in the event of a system failure or narrow streets. An interlock shall be provided to prevent operation of the ladder rack unless the apparatus parking brake has been activated. A steady red indicator light shall be located on the cab instrument panel and illuminated when the hydraulic ladder rack is not in the stowed position. The light shall be labeled "Ladder Rack". In addition, the "Do Not Move Apparatus" light located in the cab shall be activated when the hydraulic ladder rack is not in the stowed position. Flashing amber lights facing the front and rear shall be provided on the ladder rack and activated whenever the rack is in the down position. Two (2) mechanical safety locks shall be furnished to securely maintain the ladder bracket assembly in the travel position. When in the travel position, a vertically hinged door shall automatically close over the hydraulic cylinder and its pivot.

3-31.19. PIKE POLE, 10':

Two (2) pike poles, one 10' long and one 6' long with fiberglass handles shall be provided. Aluminum tubing will be used for the storage of the pike poles and may be located on the electric/hydraulic ladder rack (if applicable). If the head of the pike poles can come into contact with a painted surface, stainless steel scuff plates will be provided.

3-31.20. RUBBISH HOOK

One (1) rubbish hook, 8' long with a fiberglass D-ring style handle shall be provided. The rubbish hook may be located on the electric/hydraulic ladder rack (if applicable). If the head of a rubbish hook can come in contact with a painted surface, a stainless steel scuff plate will be provided.

3-31.21. WHEEL CHOCKS:

One pair of Zico brand wheel chocks, model # SAC-44 with mounting brackets, model # SQHC-44-H shall be installed per the direction of the Department. Exact placement will be determined at the time of the pre-construction meeting.

3-31.22. PULL-OUT TRAY:

There shall be two (3) slide-out trays with 2.00" sides and a capacity of 300 pounds. Capacity rating shall be in the extended position.

Slides shall be ball bearing, full-extension type for ease of operation and years of dependable service.

Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for it shall be located at the front of the tray for ease of use with a gloved hand.

Tray locations shall be:

- Bottom of L3 compartment
- Bottom of R3 compartment
- Bottom of Back compartment

3-31.23. ADJUSTABLE SHELVES:

There will be thirteen (13) shelves provided. The shelf construction will consist of .125" pan-shaped aluminum with 2.00" sides. Each shelf will be infinitely adjustable by means of a threaded captive nut, which is in a track

The location of the thirteen (13) shelves shall be:

- L1 – 2 shelves
- L2 – 1 shelf
- L3 – 3 shelves
- R1 -3 shelves
- R2 – 1 shelf

- R3 - 3 shelves
- Rear - 1 shelf

3-31.24. RUB RAIL:

Bottom edge of the side compartments shall be trimmed with a bright stainless steel or anodized aluminum rub rail.

Rub rail shall extend away from the body, with slanted ends to provide a pleasing appearance.

These rub rails shall not be an integral part of the body construction allowing for replacement in the event of damage.

3-31.25. BODY FENDER CROWNS:

Stainless steel or anodized aluminum fender crowns shall be provided around the rear wheel openings. The fender crowns shall be individually replaceable and shall not be integral with the inner wheel wells or any other part. An isolator shall be provided between the body and the crown to seal the seam and restrict moisture from entering.

A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

3-31.26. HARD SUCTION HOSE:

Two (2) 10' lengths of 6.00" clear corrugated PVC hard suction hose shall be provided.

One length shall be TFT model #AM4FSX10 or current TFT model meeting specifications. The hose shall be equipped with a 6.00" Storz folding handle, full-time swivel couplings on both ends.

One length shall be TFT model #AM8FNX10 or current TFT model meeting specifications. The hose shall be equipped with a 6.00" Storz folding handle, full-time swivel couplings on one end, and 6"NH male threads on the other. This hose shall be equipped with a 6.00" NH Female chrome plated barrel strainer.

3-31.27. HARD SUCTION HOSE STORAGE COMPARTMENTS:

It is the Department's intent to store hard suction hose in such a manner such as to protect the hose from sunlight, dirt and debris in an enclosed compartment or compartments. Venders may list one or more options for suction hose storage and provide pricing information and sketches with their submittal. Options for suction hose storage include but are not limited to single or dual compartments designed for rear access or dual compartments with access from above. If access from above is included in the design, compartment covers shall conform to specification for main hose bed covers (3-24.01) pertaining to strength, hinge type, material, and spring assist. The

compartment shall be designed with sufficient space to allow storage of one of the lengths of suction hose to be stored with barrel strainer attached.

3-31.28. HANDRAILS:

The apparatus body shall be equipped with handrails and mounting hardware, a minimum one (1) inch diameter constructed of non-corrosive material and covered with a non-slip material, and mounted with a minimum clearance of 2" to facilitate a fully gloved hand. Mounting hardware shall be of such design not to snag clothing, equipment, etc. All handrails shall comply with NFPA 1901.

The size and the mounting location of the handrails shall be:

- Two (2) 20" handles, one (1) adjacent to each side of the cab doors.
- Two (2) 20" handles, one (1) adjacent to each rear cab exits.
- Two (2) 60" handles mounted on the rear beavertails.
- One (1) full width horizontal handrail below the hosebed at the rear of the apparatus.
- One (1) handrail above each side pump panel.
- Four (4) chrome grab handles, one on the inside of each door.

Chrome plated end stanchions shall support the handrail. Plastic gaskets shall be used between end stanchions and any painted surfaces.

3-31.29. AIR BOTTLE STORAGE

Storage for a total of six (6) SCBA air bottles shall be provided. Air bottles shall be stored in a horizontal position and be readily accessible.

Air bottle storage flooring shall be rubber lined and be furnished with a drain hole. A stainless steel door with a chrome plated latch shall be provided. A dielectric barrier shall be provided between the door hinge, hinge fasteners and the body sheet metal.

3-31.30. URBAN-INTERFACE HOSE HANGERS

Two (2) hangers for hose used during wildland urban interface operations shall be provided. Construction may be hook shaped, or upward sloping pin design. Each hook shall be foldable, positive locking when deployed and shall be capable of accommodating 200' of 1-1/2" hose. Construction shall be of aluminum or stainless steel. Hangers shall be mounted on rear of apparatus below main hose bed, one on each side. Hangers shall be expressly constructed for this use (commercially or custom built by vendor) and shall not be constructed by modifying commercial folding steps.

3-31.31. HOSE BUNDLE STORAGE

Located within one compartment shall be one (1) storage hanger for hose bundles. Hanger shall be constructed of 6" aluminum tube. Tubing shall extend outward from the back of designated cabinet and act as a hanger for hose bundles. Hanger shall be

installed near average shoulder height such that the firefighter can easily slide hose bundles off the hanger and onto the shoulder. The hanger shall feature a small lip or other method of preventing the hose from sliding off when the apparatus is parked on a side-hill. Depth of the hose hanger shall be full available depth of compartment. Hanger shall be designed to hold the weight of two (2) 1-3/4"X100' hose bundles, 2 nozzles, and 1 gated wye.

3-31.32. ROPE RESCUE ANCHOR POINTS

There shall be a total of four (4) rope rescue anchor points, 2 located on either side of the apparatus. Each anchor point shall consist of a trailer hitch style receiver, securely attached to the frame of the apparatus. Each receiver shall be concealed behind a hinged cover. There shall be access to the side of each receiver through either cover described herein or through main body compartmentation for the purpose of installing the receiver pins. Location of anchor points shall be fore and aft of each rear wheel well and shall be spaced 36"- 44" apart on center.

2 rescue hitch inserts shall be provided. Each insert shall consist of painted steel mating insert welded to a smooth steel ring of not less than 3" outer diameter and 1" in cross-section. Each insert shall be provided with necessary locking pins.

All components of this anchor system shall be made from steel and shall be constructed to withstand a force of 9,000 Lbs in a straight pull (extending 90 sideways from apparatus) or side-load (directly forward and rearward relative to apparatus).

Two (2) 12-volt high current outlets shall be located in area of the rescue connections. See section 3-15.30 for details.

1-32. **Paint And Striping:**

3-32.1. BODY FINISH AND TRIM - GENERAL:

All exterior cab, body, hose beds, compartments and interior surfaces to be painted shall be free of all burrs, weld slag, and sharp edges. All sharp edges shall be ground to a smooth radius and all surfaces be properly sanded, cleaned, and prepared as prescribed below.

3-32.2. PAINTED SURFACES:

All exposed metal surfaces not chrome plated, polished stainless steel or bright aluminum treadplate shall be thoroughly cleaned and prepared for painting. The aluminum surfaces shall be properly etched. All steel surfaces shall be properly treated using a high-temperature, cleaning/phosphatizing system. All irregularities in the painted surfaces shall be rubbed down and all seams shall be caulked before the application of the finish coat. Both the cab and body shall be painted.

All removable items, such as brackets, compartment doors, door hinges, trim, etc. shall be removed and painted separately to insure finish paint behind all mounted items. Body assemblies that cannot be finished painted after assembly are to be finished

painted before assembly. Both the aluminum and steel surfaces to be painted shall be primed with a two component primer which is compatible with the finish coat. The apparatus shall be finish painted with the highest quality urethane topcoat. The cab and the body shall be painted red, exact color to be determined at pre-construction conference. The top of the cab from Approx. 4 inches below the window trim shall be painted white.

An isolation tape or gasket material shall be used prior to reassembly or reinstallation of the lights, handrails, door hardware or any of the miscellaneous components to prevent any damage to the finish painted surfaces. A nylon washer shall be installed under each acorn nut or metal screw that is fastened directly to a painted surface.

3-32.3. COVERED SURFACES:

Any and all surfaces being covered with ALDP, stainless steel or brushed aluminum, shall be prepared, and primed in accordance with materials needed for a complete polyurethane enamel system prior to assembly. The apparatus builder shall reserve the option to complete the finish process to the apparatus color upon reassembly.

3-32.4. WARRANTY - PAINT AND CORROSION:

Body exterior paint finish shall be warranted against blistering, peeling, bubbling, lack of adhesion or any other manufacturing or material defect for a period of five (5) years. Warranty shall be 100% for the entire five (5) years. The body shall also be warranted against corrosion perforation for a period of ten (10) years.

3-32.5. PAINT, COMPARTMENT INTERIOR:

The compartment interior shall be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

3-32.6. REFLECTIVE BAND:

A 6" gold Scotchlite Reflective Series Film (series 680) band shall be provided across the front of the vehicle and along the sides of the body.

The stripe shall be NFPA compliant.

The Scotch-lite band provided on the cab face shall be at the headlight level.

3-32.7. LETTERING:

Genuine gold leaf lettering, approximately 3.00" high shall be provided on both cab forward doors. "La Honda Fire" shall be placed on both doors. Example of font and layout to be provided at pre construction conference. The gold leaf will be encapsulated between two layers of clear vinyl. The gold leaf shall be coated with two applications of clear coating.

Genuine gold leaf lettering, approximately 3.00" high shall be provided on both cab rearward doors. "Fire Service Provided In Partnership With The San Mateo County Fire

Department" shall be placed on both doors. Example of font and layout to be provided at pre construction conference. The gold leaf will be encapsulated between two layers of clear vinyl. The gold leaf shall be coated with two applications of clear coating.

3-32.8. DOOR GRAPHICS

Both forward cab doors shall have applied to them vinyl graphic of the Brigade logo. Logos shall be 12" in height. Precise layout shall be determined and digital artwork file provided to builder at pre-construction conference.

3-32.9. ROOF LETTERING

Black lettering measuring a minimum of 18" in height shall be applied to the roof of the cab. Lettering shall read; E-57

1-33. Loose Equipment

3-33.1. LOOSE EQUIPMENT

The following loose equipment shall be provided with the apparatus:

- Selection of spare chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.
- 1 ea spare main hose bed cover (as specified in section 13-28.1)
- 2 ea spare bumper hose tray covers (as specified in section 3-10.4)
- 2 ea spare crosslay side covers (as specified in section 1-26)
- 1 ea spare main hose bed flap cover (as specified in section 3-28.1)
- DOT required safety triangles
- DOT required 5lb dry-chemical fire extinguisher mounted in bracket
- 3 spare switches as used in apparatus construction

